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DIESEL RAILWAY TRACTION SUPPLEMENT

The March issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 1s.

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch. We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are :
Mondays to Fridays 9.30 a.m. till 5 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Pitfalls of Nationalisation

MR. A. K. McCOSH is an industrialist whose wide range of industrial experience lends weight to his views on such fundamental matters as the principle of control of industry. He is a director of the London & North Eastern Railway Company, Chairman of the Scottish Colliery Owners, and an ex-president of the British Iron & Steel Federation. Recent advocacy of nationalisation of the coal mines has prompted him to write a pamphlet giving the case against such a step. Many of the cogent arguments he advances apply equally to the railway industry, which is also a target for those who believe in nationalisation. One instance alone will suffice to illustrate this. Mr. McCosh points out that a general manager—a highly trained and efficient man, who would probably be continued in his position under nationalisation—under private enterprise can obtain rapidly a decision from his directors on matters of policy and development, even if this may involve the chance of failure and consequent financial loss, and can be assured of their backing in carrying out the decision. Under nationalisation he would be the servant of some committee, or control board, or department, which, answerable to Parliament, would be very sensitive to criticism, anxious at all times to avoid the risk of failure, and concerned always with covering itself before accepting responsibility. The inevitable result would be a slowing up of the tempo of operations, and a damping down of initiative.

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Locomotives by Kitson & Co. Ltd. Again

Wartime exigencies require the maximum locomotive manufacture capacity that can be utilised at the present time, and for this reason it has been decided to bring back into use the productive capacity of Kitson & Co. Ltd. This old-established Leed's firm made locomotives for many years before 1938, but at the beginning of that year its right to manufacture locomotives was acquired by the Locomotive Manufacturers Co. Ltd. as part of a plan of voluntary nationalisation then necessary by reason of the rest of the conditions ruling in the industry. Kitson's Airedale Foundry continued its general engineering business, and the foresight of those who arranged the transaction between Kitson & Co. Ltd. and the Locomotive Manufacturers Co. Ltd. has resulted in the plant being available as a potential addition to the industry's resources in circumstances such as the present emergency. Orders for the Airedale Foundry will be placed through the Locomotive Manufacturers Co. Ltd.

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Mr. W. C. Lusk

The death of Mr. William Clardy Lusk, recorded on page 224, has removed an outstanding figure from the British electrical industry. At the time of his death Mr. Lusk was Deputy-Chairman and Managing Director of Associated Electrical Industries Limited, and Chairman of the British Thomson-Houston Co. Ltd.; he had been associated with the latter company since 1910, when he joined it as Manager of the Export Department. He was elected a director of the company in the same year, and in 1922 became Managing Director. In 1928 Mr. Lusk took a leading part in the development of Associated Electrical Industries Limited, which is associated or allied with many of the most important undertakings manufacturing electrical machinery. In 1929, when Sir Felix Pole succeeded Mr. H. C. Levis as Chairman of A.E.I., Mr. Lusk became Deputy Chairman of that company, and Chairman of the B.T.-H. company. He was an indefatigable worker, a firm and able administrator, and a keen advocate of the importance of research. During his regime the B.T.-H. research laboratory developed from small beginnings to its present important position in the scientific world.

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Post-War Problems and Management

Sir Ernest Lemon, a former Vice-President of the L.M.S.R. and now President of the Institution of Production Engineers, for some time has been favourably inclined towards the formation of an Industrial General Staff, and some of the useful purposes which would be performed by such a body have been commented on in previous issues of *The Railway Gazette*. At a luncheon address to the Engineering Industries Association on February 23, reported elsewhere in this issue, Sir Ernest Lemon took his idea further, and dealt at some length with the problems of management which will arise particularly after the war. He put forward the suggestion that a college of commerce should be established to cater for the education of those engaged in the management side of business. Large industrial undertakings might set up their own staff training colleges, such as that which the L.M.S.R. had brought into being before the war, and smaller firms, which could not set up their own schools, could amalgamate with other firms for mutual benefit, and thus provide a field for knowledge and improvements of ideas for the common good of particular industry. Sir Ernest Lemon defined manage-

ment as "the handling of men and the handling of situations," and said that he considered it an art rather than a science.

F.B.I. Report on International Trade

The International Trade Policy Committee of the Federation of British Industries has prepared a report which has been adopted by the F.B.I. One of the principal findings is that justification for private enterprise lies in its efficiency, and its contribution to the committee's welfare, and that the maximum free play for individual incentive is a pre-requisite of future success. At the end of the war Great Britain will be a debtor nation with a greatly reduced income from interest on foreign investments, and a diminished income from services such as shipping. To enable her to import even on a pre-war scale Great Britain will have to increase its visible exports by at least 40 per cent. to 50 per cent. over the pre-war level The committee points out that increases of this magnitude cannot be achieved solely by developing new products for export or by concentration on high-class goods; shipments should be spread over the generality of our export industries. The committee comments pertinently on various monetary devices which have been put forward that "no monetary arrangements, however soundly devised, can take us very far," in the absence of trading balance. The report does not lay down a clear cut road to the solution of the problems it treats, but no doubt this is due to the close acquaintance of its authors, all experienced business men, with the many difficulties involved.

Overseas Railway Traffics

Some reaction has been apparent in the prices of the stocks of British-owned railways in Argentina and this tendency has continued notwithstanding the satisfactory nature of the latest traffic returns. In the 33rd and 34th weeks of the financial year gains in gross earnings have been secured of £46,740 on the Buenos Ayres Great Southern, of £35,037 on the Central Argentine, of £18,840 on the Buenos Ayres Western, of £16,080 on the Buenos Ayres & Pacific, of £12,510 on the Argentine North Eastern, and of £7,086 on the Entre Rios. There has been a slight set-back on the Central Uruguay. Brazilian railway traffics continue to go ahead, and in the first eight weeks of 1944 the Great Western of Brazil takings show an increase of £40,800, and those of the Leopoldina an increase of £93,512. Antofagasta receipts for the same period amount to £240,830, an improvement of £24,680.

	No. of week	Weekly traffics	Inc. or dec.	Aggregate traffic	Inc. or dec.
		£	£	£	£
Buenos Ayres & Pacific* ...	34th	122,760	+ 7,560	3,391,380	+ 157,140
Buenos Ayres Great Southern*	34th	245,640	+ 38,340	5,878,800	+ 564,060
Buenos Ayres Western* ...	34th	77,220	+ 21,540	1,837,980	+ 35,640
Central Argentine*	34th	167,628	+ 19,236	4,931,286	+ 474,717
Canadian Pacific	7th	1,088,000	+116,800	6,950,400	+1,277,800

* Pesos converted at 16⅔ to £

United of Havana traffics are again showing a vigorous expansion after their earlier decline and the aggregate receipts of £1,664,499 for the 34 weeks of the financial year are £98,848 up.

Composite *Versus* All-Steel Wagons

One of the measures that has been adopted by the United States War Production Board to conserve steel has been to push the development of a composite type of wagon, built of both steel and wood, in place of the all-steel wagon types that were standard to the outbreak of war. It is estimated that ten composite bogie wagons can be built with the same tonnage of steel as nine all-steel wagons. On the other hand, there are formidable disadvantages attaching to the use of composite wagons, of which one is their smaller carrying capacity, as the timber sides take up more room than steel sheets, their increased maintenance cost, and their shorter life. In consequence, many railways have refused to place orders for the composite type of wagon, or at least have delayed doing so, and in this way an already critical wagon situation has been made still more acute, for the W.P.B. has refused to sanction all-steel construction, save for special wagon types. The Office of Defense Transportation has now put in an urgent recommendation to the W.P.B. to sanction the building in steel of roughly nine-tenths of the wagon building programme previously authorised in composite wagons only, which would not increase the steel consumption but would reduce by 10 per cent. the number of wagons built. To get over the difficulty, one proposal of the W.P.B. was for the Government to finance the building of composite wagons, through the Reconstruction Finance Corporation, and to lease them to the railways; but agreement to the O.D.T. proposal would prove an easier solution, and would result in the immediate placing of railway orders for wagons up to the limit laid down.

Canadian National Railways in 1943

When the report of the Canadian National Railways for the year 1943 becomes available, it will provide evidence of the company's ever-increasing contribution to the war effort, and will show both the operating net revenues and the cash surplus to have exceeded all records. These statements were made in the course of a recent review of the system's activities during 1943 by Mr. R. C. Vaughan, Chairman & President, some details of which are given on page 227. Mr. Vaughan points out that the C.N.R. is assisting the war effort by the provision of transport by land, sea and air, as well as by the manufacture of munitions and the cosstruction and repair of ships. Although the management is endeavouring in every way to operate with the use of substitute materials and with reduced staffs, it cannot altogether conceal its anxiety as to the assumption of increasing responsibilities in face of its present manpower and equipment difficulties. It is also not unmindful of the system's post-war position as the largest transport industry and purchaser of supplies in the Dominion; and, although Mr. Vaughan suggests that there are few signs to suggest an early termination of hostilities, he points out that (as already recorded in our columns) plans are in hand to meet peacetime conditions.

Properties of Stainless Steel

The widespread use of stainless steel for diesel trains, locomotives, and railcars in the U.S.A. and in Italy has attracted attention not merely to the comparatively high tensile strength of such material but also to the corrosion-resisting properties. This steel contains 8 per cent. of nickel and 18 per cent. of chromium, and is claimed to have an ultimate strength of 150,000 lb. per sq. in. and an elastic limit of 120,000 lb. in conjunction with what is considered as satisfactory ductility. Accelerated corrosion tests conducted in the laboratory of one of the railways using stainless steel welded up on the Budd shot-weld principle showed that continuous boiling in pure 65 per cent. nitric acid for 720 hr. resulted in the loss of surface metal to the extent of only 0·01 in., whereas ordinary sheet steel tested under the same conditions showed a loss equivalent to no fewer than 125 in. Moreover, pieces of stainless steel which were badly distorted and then straightened cold several times showed no greater loss from the effect of nitric acid; and where Shotwelds were twisted off from the stainless-steel sheets they joined, there was no evidence of corrosion.

Making the Most of Electrification

An electric passenger service on which 80 trains daily cover a distance of 76 miles in less than 80 min., averaging between them 62·1 m.p.h. though the majority of the trains make from one to four intermediate stops, is one calling for comment. The service concerned, which is described on p. 218, is that of the Pennsylvania Railroad, and forms a part of the electrified main line of that railway over the 224·8 miles between New York and Washington. Throughout the day hourly expresses run over the 91·3 miles between New York and Broad Street, Philadelphia, and another hourly series between New York and Washington; 48 trains cover the entire New York-Washington distance daily at an overall average speed of 55 m.p.h., only one of which has less than five intermediate stops; this means an average journey time of 4 hr. 5 min. for a distance only 7 miles less than that from Kings Cross to Darlington. The best time, 3 hr. 30 min., is that made by the northbound Advance Congressional, which is unique in the United States by reason of making a non-stop run of 214·8 miles, from Washington to Newark, with electric haulage at an average of 66·1 m.p.h. Of point-to-point timings the fastest is that of the Congressional proper, which covers the 76 miles from North Philadelphia to Newark in 64 min. at 71·3 m.p.h. start to stop. Such timings are the more remarkable in that these and other trains in the service may load up to 16 cars, making a gross weight of 1,200 to 1,250 tons to be hauled at running speeds up to and exceeding 80 m.p.h. by the streamline "GG1" locomotives used.

Diesel Railcars in Northern Ireland

Considerable use has been made of diesel railcars in Northern Ireland in recent years, and frequent services are maintained by the L.M.S.R. Northern Counties Committee by this means, between Belfast and Kilroot, and Belfast and Ballymena. There is also a service between Belfast and Magherafelt, and the total daily mileage operated by railcars is now approximately 300. To

meet the need for increased accommodation, light centre-corridor units, which seat 100 passengers, are in use, and some illustrations and details of these vehicles are given in the current issue of *The Railway Gazette, Diesel Railway Traction Supplement*. A feature of these units is their remarkably light weight in relation to seating capacity; each vehicle weighs only 17½ tons and has a length of 62 ft. and a breadth of 9 ft. 5½ in. In view of the present high cost of operating railcars, experiments with producer gas have been conducted recently, and the use of a gas-producing unit capable of running one of the two engines of one of the cars has been obtained. The information gained is being used in designing a plant which could feed both engines.

The Electrical Industry in 1943

Preoccupation with the needs of the war has prevented the electrical industry from having much of railway interest to report in the account of progress and activities during 1943. We understand, however, that a further stage has been reached by the British Thomson-Houston Co. Ltd. in the development of the pumpless steel-tank rectifier to meet the exacting requirements of electric railway traction. Many B.T.-H. rectifiers of this type have been operating satisfactorily in railway service for some time, and during 1943 the largest pumpless rectifier sub-station in the world was completed. This serves the railway system of the London Passenger Transport Board and contains 8,000 kW. of B.T.H. pumpless rectifiers. Among new orders received for this class of railway equipment was one from the Great Indian Peninsula Railway; here the requirement was for 3,000 kW. at 1,500 volts, which has hitherto been regarded as an unusually high pressure for rectifier equipment on railways. In an altogether different sphere pumpless rectifiers are giving satisfaction at far higher voltages. Thus one unit for the supply of radio transmitters has been in service on loads up to 660kW. at 18,000 volts.

An Earlier Accident in Jamaica

The serious derailment which occurred recently on the Jamaica Government Railway, illustrated in our issue for February 4, when a goods train attained an excessive speed on a down gradient, for a reason not yet explained, recalls that the accident record on these lines has been an extremely good one, a period of 94 years elapsing after the opening of the first section before an accident took place involving passenger fatalities. This one occurred on July 30, 1938, when a passenger train running from Kingston to Montego, along a route abounding in sharp curves and steep gradients, left the rails soon after passing the outlet points of a siding. The locomotive was caught by the side of a cutting and the vehicles violently thrown about and greatly damaged. There was a bank engine in rear of the train. Out of 300 persons on board 32 were killed and 105 injured. A special commission was appointed to deal with the case. It found that certain rules were not being observed and that unofficial hand signals were being used. The speed of the train was thought to have been approaching double that permitted at the locality, and some minor defects in the permanent way were considered to have contributed to the disaster. The use of banking engines in rear of trains was at once prohibited by the General Manager & Chief Engineer, Mr. H. R. Fox. An illustrated account of this accident appeared in our issue for July 21, 1939.

Signal Lights at Dover Harbour

The signal seen in the upper right hand illustration on page 141 of our February 11 issue affords an example of the use of special signal lights in signals facing seawards on lines serving harbours and similar localities. It will be noticed that the upper (danger) glass in the spectacle plate is of milk glass, giving a short range white light; the lower (all-right) glass was violet. The harbour authorities were desirous of having no red or green lights, other than any belonging to their own distinguishing marks, showing from the pier, and this special arrangement had to be applied to a number of signals. We are under the impression that it was adopted also at Folkestone. We even heard a story to the effect that violet was used for danger in one particular signal in the district, establishing a contradiction that passed unnoticed for some years! The use of special lights in signals facing to the river has been adopted on occasion on lines serving wharves on the Thames, particularly those belonging to the gas companies on which there are elaborate signalling installations, fully interlocked. In this case the glasses used are officially designated as "port wine" and "blue," but what particular hue of light each produces we have not had the opportunity of seeing. Their range no doubt would be short, but quite sufficient for the class of traffic and the conditions obtaining on the quays.

Great Western Railway Company

THE full report and accounts are issued in the modified form approved by the Ministry of War Transport. It is noted that as on previous occasions no specific allocation has been made in the accounts in respect of war damage, although the incidence of the liability has been borne in mind. The Bill dealing with payments in respect of war damage to, and contributions from, public utility undertakings, including railways, has not yet been submitted to Parliament. Discussions with the Government are continuing, but it is not possible at this stage to give any further information.

In order to secure further co-ordination of the activities of Carter Paterson & Co. Ltd. and Pickfords Limited, the shares in Carter Paterson & Co. Ltd. which were held by the four main-line railway companies have been transferred to Hay's Wharf Cartage Co. Ltd. (which controls Pickfords Limited) in exchange for a similar number of shares in the Hay's Wharf Company. Results for the past three years are as follow:—

	1941	1942	1943
	£	£	£
Total expenditure on capital account ...	188,484,231	188,779,668	188,009,860
Joint lines—Company's proportion net revenue	142,273	142,273	142,273
Miscellaneous receipts (net)	268,051*	268,488*	269,379*
Net revenue	6,931,767	6,932,746	6,939,982
Interest on loans and debenture stocks	1,649,855	1,649,855	1,649,854
Dividends on rentcharge, guaranteed, and preference stocks	3,339,914	3,339,914	3,339,914
Balance after payment of preference dividends	1,941,998	1,942,977	1,950,214
Dividend on ordinary stock	1,717,189	1,931,838	1,931,838
Rate per cent.	4	4½	4½
Appropriation to contingency fund ...	250,000	—	—
Surplus or deficit (+ or −)	− 25,191	+ 11,139	+ 18,376
Balance brought forward from previous year	289,129	263,938	275,077
Balance carried forward to subsequent year	263,938	275,077	293,453

* Other than those included in financial arrangements with Government.

Net revenue for the year shows an increase of £7,236, at £6,939,982. Dividends on the ordinary stock for the past ten years have been as follow:—

1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
%	%	%	%	%	%	%	%	%	%
3	3	3	4	½	3½	4	4	4½	4½

Miscellaneous receipts (net) from interest and dividends derived from investments in other undertakings included £231,050 from investments in associated bus companies, comparing with £231,966 in 1942, and also £35,325 (£35,301) from Hay's Wharf Cartage Co. Ltd. The balance sheet shows a payment of £11,618,924 by the Company to the trust fund in respect of arrears of maintenance in terms of the railway control agreement, together with £83,461, the Company's proportion in respect of "J" joint lines.

Southern Railway Company

CONTROL of the undertaking by the Minister of War Transport continued during the year 1943 in accordance with the Order made under the Defence Regulations, 1939. As last year, a variation in the usual form of accounts and statistical returns consequent on Government control has been authorised by the Minister of War Transport. The preliminary statement by the directors published in *The Railway Gazette* of February 25 shows that the net revenue for the year 1943 amounts to £6,999,186, an increase compared with that for the year 1942 of £85,672. The balance brought forward from the previous year was £89,996, making £7,089,182 available for distribution. After meeting the interest and dividends on the pre-ordinary stocks, the amount available for ordinary dividends is £2,094,737, enabling a dividend of 2 per cent. to be paid on the deferred ordinary stock and leaving £85,602 to be carried forward. The Freight Rebate Scheme has been varied temporarily during the period of Government control of the railways. From July 1, 1943, freight rebates on export and bunker coal were suspended, and the appropriate proportion of railway rates relief which would have been available for rebates on coal traffic has been paid to the Minister of Fuel & Power for use in connection with the production or marketing of coal.

Dividends for the past ten years are given below:—

	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
	%	%	%	%	%	%	%	%	%	%
Pref. ordinary ...	4	5	5	5	5	5	5	5	5	5
Def. ordinary ...	Nil	Nil	½	1½	Nil	1½	1½	1½	1½	2

Among the miscellaneous receipts are £35,336 (£35,312) from Hay's Wharf Cartage Co. Ltd. The investment in this undertaking amounts to £796,024 and consists of £33,160 six per cent. cumu-

lative preference shares and £520,679 ordinary shares. In the following table the chief financial items of the Company for each of the past three years are summarised :—

	1941	1942	1943
	£	£	£
Total expenditure on capital account	174,973,903	175,168,167	175,218,441
Joint lines—Company s proportion net revenue	Dr. 38,914	Dr. 39,705	Dr. 39,679
Miscellaneous receipts (net)	*191,291	193,255*	*199,992
Net revenue	6,934,260	6,913,514	6,999,186
Interest on loans, debenture stocks, etc. ...	2,243,167	2,243,167	2,243,167
Dividends on guaranteed and preference stocks	2,751,278	2,751,278	2,751,278
Balance after payment of preference dividends	1,939,815	1,919,069	2,004,741
Dividend on ordinary stocks	1,930,409	1,930,409	2,009,135
Rate per cent.—			
Preferred ordinary	5	5	5
Deferred ordinary	1¾	1¾	2
Surplus or deficit (+ or —)	+9,406	—11,340	—4,394
Balance brought forward from previous year...	91,930	101,336	89,996
Balance carried forward to subsequent year ...	101,336	89,996	85,602

* Other than those included in financial arrangements with Government

The balance sheet shows £3,523,391 (£2,839,207) in Government securities, £2,269,075 (£1,350,000) in tax reserve securities, and £2,043,672 (£2,014,425) in road transport undertakings. The payment to the Trust Fund in respect of arrears of maintenance, etc., in terms of the Railway Control Agreement is £13,537,629 (£9,571,768) by the Company itself, and £88,542 (£59,407) " J " joint line (Company's proportion).

London & North Eastern Railway Company

AS in 1942, in accordance with the requirements of the Ministry of War Transport, the financial accounts for the year 1943 are presented in a condensed form and the statistical returns are suspended. A Bill has been introduced into Parliament in the present Session to authorise the Company to establish a savings bank for its employees and to amalgamate therewith the existing savings banks maintained by the Company, and for other purposes. Construction has continued, as far as practicable, in the case of those works or portions of works with which it has been decided to proceed under the Railways (Agreement) Act, 1935, and the London Passenger Transport (Agreement) Act, 1935. The total sum expended under these heads up to December 31, 1943, was :— Railways (Agreement) Act, 1935, £3,423,140 ; London Passenger Transport (Agreement) Act, 1935, £7,004,469.

As shown in the preliminary statement published in *The Railway Gazette* of February 25, the net revenue for the year 1943 was £10,655,441, a decrease of £45,158 in comparison with 1942. Adding the balance of £78,476 brought forward and £135,419 profit on sale of investments, makes a total of £10,869,336, and appropriating £200,000 to contingency fund leaves a balance of £10,669,336 available for distribution. After providing for all fixed charges and dividends on the guaranteed stocks, and meeting the dividends on the 4 per cent. first preference stock and the 5 per cent. redeemable preference stock (1955), there remains a balance of £1,899,020, which permits of a dividend of 2¾ per cent. on the 4 per cent. second preference stock, leaving £80,110 to be carried forward. Dividend payments for the past 10 years are shown in the following table :—

	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
	%	%	%	%	%	%	%	%	%	%
Pref. ord., 5% ...	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2nd pref., 4% ...	Nil	Nil	½	1¾	Nil	¾	2	2¾	2¾	2¾
1st pref., 4% ...	3½	3½	4	4	Nil	4	4	4	4	4
Red. pref., 5% ...	4 1/16	4 1/16	5	5	Nil	5	5	5	5	5

The miscellaneous net receipts of £528,651 shown for 1943 include £476,155 (£475,339) dividends from associated bus companies. They also include £6,375 (same) from Currie & Co. (Newcastle) Ltd. and £35,321 (£35,297) from Hay's Wharf Cartage Co. Ltd. Results of the whole undertaking for the past three years are summarised in the accompanying table :—

	1941	1942	1943
	£	£	£
Total expenditure on capital account	361,221,614	361,258,965	360,902,642
Joint lines—Company's proportion net revenue	350,558	350,558	350,558
Miscellaneous receipts (net)	*502,257	*515,775	*528,651
Net revenue	10,647,027	10,700,599	10,655,441
Profit on realisation of investments	—	—	135,419
Appropriation to contingency fund	300,000	200,000	200,000
Interest on loans and debenture stocks, etc. ...	4,214,637	4,212,387	4,210,137
Dividends on guaranteed and preference stocks	6,131,056	6,296,411	6,379,089
Balance after payment of preference dividends	1,334	Dr. 8,199	1,634
Balance brought forward from previous year...	85,341	86,675	78,476
Balance carried forward to subsequent year ...	86,675	78,476	80,110

* Other than those included in financial arrangements with Government

The cumulo annual value for rating purposes of the lands and heritages forming the Company's undertaking in Scotland, and including the Forth Bridge Railway, for the third quinquennial period commencing at Whitsunday, 1943, has been settled at £273,333 gross and £205,000 net, being a decrease of £20,000 in gross annual value and £15,000 in net annual value upon the figures settled for the second quinquennial period from Whitsunday, 1938. This settlement has been agreed on the basis that neither the Assessor of Public Undertakings nor the Company is to be prejudiced as respects future valuations.

The balance sheet shows that at December 31, 1943, the investments in Government securities amounted to £6,085,097, as compared with £5,862,185 at December 31, 1942, and tax reserve certificates were £1,500,000, against £1,000,000. The payment to the Trust Fund in respect of arrears of maintenance, etc., in terms of the Railway Control Agreement, amounted at December 31, 1943, to £25,265,465, of which £24,283,534 was by the Company itself and £981,931 in respect of its proportion for " J " joint lines. At December 31, 1942, the corresponding total payment was £18,514,556, namely £17,779,989 by the Company and £734,567 in respect of " J " joint lines. The directors again wish to record their appreciation of the efficient manner in which the Company's staff have carried out their duties under the difficult conditions caused by the war.

Great Southern Railways Company (Eire)

THE report for the year 1943 shows that the improved position in comparison with 1942 was due mainly to higher net receipts from the railway, to the larger sum brought in, and to the fact that in 1942 there was included in interest, rentals, and other fixed charges a sum of £84,000 by way of income tax provision in respect of current earning. Negotiations with the taxing authorities in connection with wear and tear allowance have made provision for taxation for the year 1943 unnecessary. Reference is made in the report to the capital reconstruction scheme which will be included in the Government Bill dealing with the whole transport position in Eire, the terms of which Bill are not at present available. Some figures for the past two years are shown in the accompanying table :—

	1942	1943
	£	£
Total expenditure on capital account	31,237,580	31,336,555
Railway gross receipts	3,928,417	4,792,490
Railway revenue expenditure	3,721,520	4,437,131
Railway net receipts	206,897	355,359
Net receipts from other businesses	329,869	252,358
Miscellaneous receipts (net)	30,480	34,057
Total net income	567,246	641,774
Interest, rentals, and other fixed charges	468,680	379,105
Dividends on guaranteed preference stock	Nil	*233,180
Dividend on 4 per cent. preference stock	Nil	71,049
Dividend on ordinary stock	Nil	23,338
Rate per cent.	—	3
Brought forward	27,188	125,754
Carried forward	125,754	60,856

* For years 1941, 1942, and 1943

Railway traffic receipts improved under all heads except livestock. Passengers brought in £1,186,247, against £762,697; parcels, mails, etc., £563,154, against £503,104; merchandise £1,859,293, against £1,625,169, and coal class and " other minerals " £760,999, against £604,980. On the expenditure side it is noticeable that locomotive running expenses have been reduced from £1,478,299 to £1,445,459. Expenditure on renewal of way and works and of rolling stock has gone up from £1,063,656 to £1,761,189, and it is noted that the figure for rolling stock includes stock and works in progress written off £50,312. In road transport working total receipts dropped from £1,294,307 to £1,282,967, caused entirely by a fall on the passenger side (including hire of vehicles) from £741,228 to £720,388. Receipts from goods services were £552,769 compared with £544,024. Net receipts from road transport working amounted to £244,357 in 1943, against £336,321 in 1942. Catering profits, however, rose from £6,214 to £25,278.

Reservation of Train Seats on G.N.R.(I)

THE Great Northern Railway (Ireland) introduced recently an arrangement for the reservation of seats on main-line trains between Belfast and Dublin, Belfast and Londonderry, and in through coaches working between Dublin and Londonderry. First, second, and third class accommodation is provided on this company's trains (with the exception of a small number of railcar services working at branches) and reservations can be made in each class on payment of a uniform charge of 1s. for each seat. From its introduction the facility has been used largely, particularly on the Belfast-Dublin line, which caters for a substantial first and second class traffic.

A very large volume of holiday passenger traffic moves between Belfast and Dublin (the two largest cities in Ireland—each with a population in the region of half a million) during the fixed holiday times. This has been inflated during recent years by the large numbers of services personnel and industrial and agricultural

workers visiting their homes in Eire at such times. Under the agreement with the Coal Controller, the Great Northern Railway (Ireland), in common with the other railways in Northern Ireland, cannot exceed the train mileage worked during the year 1942, and in view of the anticipated movement of traffic over Christmas, 1943, it was decided to maintain the reservation arrangement from December 20 to December 30. It is of interest to note that the present arrangement for the customs examination of passengers' luggage *en route* between Dublin and Dundalk (the Eire main-line border station) is dependent on the careful regulation of train loads—approximately to actual seating capacity—as the over-crowding, particularly of corridors, would make impossible the task of the customs officials, who carry out a most intensive search on the journey.

Advance booking and reservation offices were opened in Belfast and Dublin on December 1, and the greater proportion of passengers who travelled over the peak period were in possession of their tickets before the middle of the month. The very heavy advance booking made the regulation of traffic out of Belfast, in particular, a comparatively simple matter, notwithstanding the inevitable last minute rush of travellers, who, for one reason or another, were not in a position to avail of the pre-booking facilities (such as services personnel and agricultural workers); trains were despatched from this terminus in practically all cases loaded to the provided seating capacity, with sections left completely free (that is, empty coach or coaches with platform and corridor doors locked) for intermediate passengers joining at the important junctions of Portadown and Goraghwood. The normal procedure whereby a passenger is allotted a seat in a particular position in the train was varied during the holidays to allot only a seat—this because of the necessity for rapid loading of the large number of reserved passengers, in many cases 400 to a train.

The following over-all figures for the period give a clear indication of the extent to which the public availed itself of the facility offered:—

WEEK ENDED DECEMBER 26, 1943

From Belfast—
Proportion of available seats reserved by passengers ... ... 54 per cent.
Proportion of passengers purchasing rail tickets at Belfast who also reserved seats ... ... 74 per cent.

WEEK ENDED JANUARY 2, 1944

From Dublin—
Proportion of available seats reserved by passengers ... ... 30 per cent.

As a result of the experience gained over the Christmas period similar arrangements will be operated over the peak periods this year.

Coal Prices and the Future

EVERYONE in these islands knows that we depend on our industrial exports to live. Even Members of Parliament are fully aware of this ineluctable fact. We are entitled to expect, therefore, that it is the duty of each one of them, whatever his (or her) party colouring, to keep in mind the effects of new legislation on our export trade. Yet a glimpse at the coal industry at the present moment shows what a gross departure has been made from this primary duty. If first things had come first, if correct principles had been observed, or even if mere horse sense had been brought to bear on this matter, there would have been no wage increases in the coal industry, or any other industry, without a corresponding increase in production. But in spite of all warning this has been consistently and repeatedly done. The name of this process—a process which has been adopted by our legislators in spite of the fears and warnings that they have themselves expressed about its dangers—is inflation. In a country such as ours inflation means depreciation in the value of savings, an extremely unhealthy exporting position, and enhanced food prices. It might be expected that the greatest endeavour would have been made by all the political parties to guard against such consequences, but the tendency unfortunately has been very much in the contrary way. Thus by the time Japan is defeated miners' wages will probably be double the pre-war level and the productive efficiency of the industry still further reduced.

How is this rake's progress to be arrested? Surely the only way open is to restore the correct relation between wages and production. In the coal industry this means that the output per man-shift would have to be increased to something like 40 cwt. without any further increase in wages. The remoteness of such a possibility need not be stressed.

Some relief will doubtless be secured from more economical methods of burning coal and indeed the position would be equalised if new appliances could be devised to give twice the efficiency of those in general use before the war. In the domestic field, thanks to the British Coal Utilisation Research Association, this has been pretty well achieved but no such economies can be expected from gasworks, central electricity stations, steelworks, or railway transport, although smaller industrial concerns can be counted on to get better results from their coal consumption as the combined effects of Dr. Grumell's economy drive and the prohibitive cost of coal itself. Some relief will also result from the greater use of machines—especially power loaders—in the mines but before the full benefits can be obtained from machines a much more intelligent and co-operative spirit will have to be shown by the miners. We entertain no hope of such a development.

So far as the direct export of coal is concerned then, little can be expected of the developments we have enumerated as militating against the high and still growing wages costs. Nor unfortunately does the matter end here. The wages of railway workers have been increased by over £80 million a year since the war began, and some at least of this huge additional bill must be reflected in the cost of our goods for export. This applies with especial severity in the case of such heavy industrial exports as steel into which the cost of coal and transport enters so largely. As Mr. John Brown, General Secretary of the Iron & Steel Confederation, points out in an article contributed to the December issue of *Man and Metal*, "A 10 per cent. increase in transport rates will increase the cost of producing a ton of steel ingot by at least 1s. 3d., and as this increase is cumulative throughout the subsequent processes, by the time the section reaches the consumer it must represent a substantial addition to the price." Unfortunately, in our view, this is the only sensible thing that Mr. Brown has to say in his article, for his solution to the post-war reconstruction of the steel industry amounts to what we can only consider to be an uncouth mixture of state control, with partial state ownership, and restrictive legislation to compel consumers to purchase their supplies from the nearest blast furnaces. To abolish free markets in this way may outrage economic principles but no doubt it fits in very well with the pseudo planning which is so marked a characteristic of the current brand of socialism. The relief to be expected from such measures would be negligible in relation to the swollen wages costs, and the incidental drawbacks would shatter all hope of our steel industries being able to compete in the world's markets. Much the same, of course, holds true of other industries producing goods, the final prices of which are substantially affected by the cost of coal or power consumed in their manufacture, and as the wealth of the nation is dependent on coal to the extent of 80 per cent. we have a fairly accurate measure of just what devastating repercussions uneconomic coal prices are going to have on our export trade.

Other nations, it is true, may also fail to control inflationary tendencies, in which case a total revaluation of prices will take place in the international market. In this event the gains obtained by the miners, railwaymen and other exploiters of the national emergency will prove to be entirely transitory and will not lead to any permanent increase in their standard of living; all prices will automatically rise to a commensurate degree with such inflation and the real value of wages will simply revert to the pre-war standards and the competitive strength of British industries will be restored. Should this be the solution, however, the lot of those millions of people who have responded so generously to the Government's persuasive appeals to contribute all they can to war savings will indeed be unenviable.

THERMIC SYPHON SAFETY.—The use of thermic syphons in locomotive fireboxes is now a recognised means of promoting improved circulation, and of facilitating the generation of steam, especially in large boilers; the possibilities of the syphon or syphons acting as a safety precaution are not so widely realised. Two cases have occurred recently in the United States in which the water in boilers equipped with thermic syphons was allowed by engine crews to fall to levels 7½ in. and 8½ in. respectively below the top of the crown-sheet. In the worse example, the crown-sheet between the front corners of the syphons and the tubé-plate was overheated and bent downwards, under the steam pressure, to a depth of 18 in., bending over part of the top of the tube-plate and loosening a few tubes and staybolts; but the upper ends of the two syphons held the whole of the remainder of the crown-sheet in position, and the water that continued to circulate through the syphons protected the major part of the crown-sheet from overheating. Fortunately, despite the depression of the front portion of the crown-sheet, the welds all held. It is the considered opinion of officers of the railways concerned that in both cases serious boiler explosions would have occurred but for the existence of thermic syphons in the fireboxes. These particular syphons were 18 and 20 years old respectively; more recent types of syphon extend further forward in the firebox, almost to the tube-plate, and had the latter been in use, it is possible that no depression of the front of the crown-sheet would have occurred, and little if any serious overheating.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Railway Agreement

The British Railway Stockholders Union Limited,
25, Victoria Street,
London, S.W.1. February 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your leading article on the second railway agreement and my Union's manifesto seems to call for an answer from the special angle of those who have subscribed the equity capital of the railways. As an individual, I have every sympathy with your reference to the national crisis at the time the agreement was negotiated. No individual would or should grudge any sacrifice demanded of him, but I am less clear when other people's money is in question. Surely the first duty cast on a board of directors is to protect the interests of their shareholders and keep them advised as to the progress of their investment.

The late Lord Luke once said: "My job is to earn dividends for the shareholders of my companies and once a year to explain to them how I did it." I am sure any chairman of the four main-railway lines will subscribe to this succinct but admirable dictum.

You state that the first agreement was never signed. If this was so, and I have no reason to doubt the statement, it is quite certain that stockholders were never informed of the fact, though they knew with certitude that the agreement was implemented, inasmuch as it dictated the terms of the 1940 dividends. Both the railway boards and the Government regarded the first agreement as a definite instrument and one which had to be abrogated, in order that the second agreement might replace it. In these circumstances I submit that the fact of signature or no signature should not be advanced as a justification for jettisoning the first railway agreement, to the detriment of equity holders, particularly after the four chairmen made this joint declaration: I quote Lord Stamp's words at the L.M.S.R. meeting on March 7, 1941:—

> "We have now been notified by the Government that they propose to invoke the clause in the agreement (which provides for revision for any major cause) for a reconsideration of this provision rendered necessary by reason of the principles of the War Damage Bill. It seems to be contemplated that the public utilities, including the railways, shall come under a comprehensive scheme of their own. We have replied that we are willing to negotiate such a revision for the future, but we have not yet any intimation of the basis suggested. We did so on the understanding that no revision should be made to the prejudice of the controlled undertakings or place them in a more unfavourable position than under the existing agreement. This seems to us a fair stipulation, for we see no reason why the Government should be influenced by interested pressure to take advantage of revision on this point to put the railways in a weaker position on others."

Plainly the four chairmen regarded this understanding as accepted by the Minister who was negotiating the revised agreement and, in fact, the condition was accepted as a preliminary to negotiations by the Government itself. *Hansard* (November 13, 1940) records:—

> *Mr. Strauss:* "Is it the case that the only change contemplated in the present agreement is a change arising from the War Damage clause, and that otherwise the main principles of the agreement will stand?"
>
> *Lt.-Colonel Moore-Brabazon:* "That is the present intention."

I submit, from the standpoint of stockholders, the situation could not be clearer; if it is not as the union's manifesto states, they were deceived.

George Carr Glyn, a personality in his day and generation, said of railway chairmen:—

> "Perhaps the ascendancy of one man over another is seldom more agreeably seen than when standing before a huge expectant audience, he enlivens the platitude of one with some light epigrammatic touch, answers another with a clear tabular statement, *or replies to a third with some fallacy so like a fact that the recipient sits contentedly down, almost as wise as he was before.*"

I cannot believe that Lord Stamp and his fellow chairmen spoke at the 1941 railway meetings in any such flippant mood, or that the Minister of Transport meant anything less than he said when he replied to Mr. Strauss's question.

At any rate, it is this reading of the known facts which shareholders regard as justifying their claim that the second railway agreement should be reconsidered in view of net earnings aggregating well over £100 million a year.

In your issue of February 25, commenting upon the amusing cartoon "The Railway share-out," you, Sir, ask "Would not the Government have got it in any event, if not as a result of the present arrangement, then by the operation of Excess Profits Tax?" The answer is definite and certain—No.

It is impossible to believe that the House of Commons intended £78 million worth of railway stock to go without any dividend at all. During the '30s, British railways were a depressed industry; their net revenues never returned to the 1929 standard, as did general industry. Before the Excess Profits Tax operated, an official inquiry, which the House of Commons itself made possible, would have decided that the Standard Revenue embodied in an Act of Parliament was no more than "fair profit." It will be remembered that the Standard Revenue represents only 4·7 per cent. of the whole capital of British railways.

I apologise for the length of this letter, but the matter is important not only to 855,000 stockholdings, but for the credit of the Government which negotiated the second agreement.

Yours faithfully,
ERNEST SHORT,
General Secretary

[Our comment that the first agreement was not completed or fully implemented is factually correct, but this statement was made for record and not for argumentative purposes. We certainly did not intend to imply that the Government took advantage of the fact that a detailed agreement had not been signed to jettison it and replace it by one less favourable to stockholders. It is agreed that its financial terms were implemented, but the obligation to adjust rates and charges to meet variations in working costs was not fully implemented. We agree that the revision of the agreement was rendered necessary by reason of the principles of the War Damage Bill, but the chairmen's speeches at the 1942 meetings clearly showed that a further consideration was the fact that the increased rates provisions were at variance with the Government's stabilisation of price policy.

Mr. Short is very emphatic in his answer to the question relating to Excess Profits Tax, but he does not support his "definite and certain—No" by particularly cogent arguments. The E.P.T. position is very obscure and probably no one, even in the Inland Revenue Department, knows exactly what the situation would be in that respect if the existing financial agreement was revoked. Judging from the experience of commercial undertakings, Mr. Short is unduly sanguine as to the amount of profit which the railway companies might be permitted to retain under Excess Profits Tax. The net revenues of the four main-line railway companies since 1930 have been below the amount of the rental, as the following table shows:—

1930	.. ..	£37,700,000	1935	.. ..	£34,000,000
1931	.. ..	£35,100,000	1936	.. ..	£35,400,000
1932	.. ..	£2[illegible],700,000	1937	.. ..	£37,900,000
1933	.. ..	£31,000,000	1938	.. ..	£29,000,000
1934	.. ..	£33,000,000	1939	.. ..	£36,932,000

A basis struck on the standard years might not have been as good from the point of view of the companies as the rental agreement. To say that "before the Excess Profits Tax operated an official inquiry . . . would have decided that the standard revenue . . . was no more than a 'fair profit'" is pure hypothesis.—ED. *R.G.*]

Publications Received

To Help You Use Jacks Properly!—From the Consolidated Pneumatic Tool Co. Ltd. we have received a booklet giving maintenance and safety hints for users of mechanical lifting jacks. Stress is laid first of all on the selection of the right jack for the job, and as the booklet is published by the Duff-Norton Manufacturing Co. Ltd., it is natural that the varieties illustrated should be of Duff-Norton design. In view of the great number of inexperienced persons using jacks at the present time, this booklet may be considered opportune.

Sif-tips—The latest number of this quarterly publication of Suffolk Iron Foundry (1920) Limited contains an informative article on welding stainless steel; due to the relatively poor conductivity and other peculiarities of this material a special technique has to be used. Another article describes how a Sifbronze welding repair carried out on a tractor casing enabled a useful machine to be at work again 12 months before a new spare part could have been expected from the United States. The third technical article is one of a series dealing with aircraft welding technique. Consideration is given to methods for uniting light tubular members.

The Scrap Heap

Men and women employees of the London Passenger Transport Board have contributed £24,132 to the Red Cross Penny-a-Week Fund.

* * *

G.W.R. motor and horse vans carried 6,226,322 tons of goods and parcels last year—1,254,666 tons more than in 1939. At the same time there was a saving of 3,191,878 van-miles by the dove-tailing of services.

* * *

By the end of January employees of the British main-line and Northern Ireland railways had contributed £282,196 to the Red Cross Penny-a-Week Fund. Totals for Great Britain were as follow: G.W.R., £38,552; L.M.S.R., £109,144; L.N.E.R., £101,608; and Southern Railway, £32,732. Staffs of Northern Ireland railways have contributed £160.

* * *

There are four dance bands, a Home Guard band, a light orchestra, a mixed choir of 70 voices, and a ladies' choir of 40 at the L.M.S.R. Wolverton works. The participants carry out rehearsals after working a 60-hour week, and give numerous entertainments for charities as well as for troops stationed locally. They have already raised over £16,000 for charity since the war began.

* * *

Clergymen Railwaymen

A number of clergymen are working on American railways to help towards relieving the manpower shortage, and doubtless also to gratify a love of the railway. The November, 1943, issue of the *Baltimore & Ohio Magazine* illustrated several of them at work on that system. The Rev. Russell Oyer, of Baltimore, heard a railwayman member of his church declare "We just can't get enough workmen," and immediately volunteered, with the result that he now spends three days a week as a B. & O. track labourer. His foreman is the church member already mentioned. The Rev. Thomas R. Rehorn, of Toledo, spent the whole of his August holiday working as a railway switchman. The record of the Rev. Roy Anders, of Cincinnati, goes back further, as he has worked for the B. & O. as a brakeman since 1920, and ever since has carried on this dual function—railwayman six days a week, and minister on Sundays and in the evenings.

* * *

Railway Coal Waggons.—Wanted immediately, Six new substantially-built Railway Waggons, constructed so as to correspond in every respect with those now used for the conveyance of coals on the South-Eastern Railway. Persons desirous of furnishing the same are requested to send their terms, and state the time when they will be delivered on to the above Railway at Tonbridge, to Mr. Wm. Bull, Medway Navigation Office, Tonbridge, Kent.

January 31, 1844.

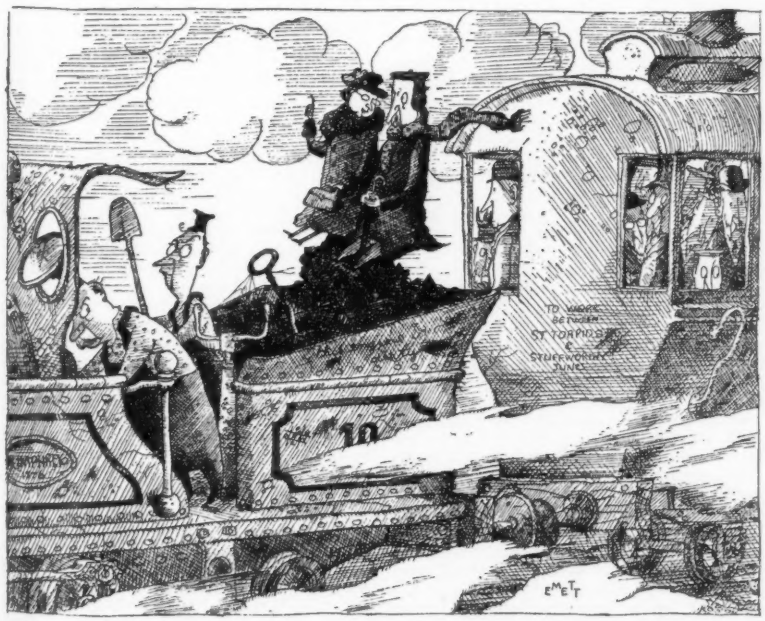
Facsimile advertisement from "The Railway Times" of February 3, 1844, inserted a few days in advance of the opening of the last section of the line through to Dover

* * *

Two free scholarships to McGill University are offered again this year by the Canadian Pacific Railway Company, according to an announcement by Mr. W. M. Neal, Vice-President of the system, which marks the 27th annual scholarship-offer by the C.P.R. Subject to competitive examination, scholarships are available to all employees of the company who are under 21 years of age, and to minor sons and daughters of employees.

* * *

In the year 1912 a remarkable accident happened on the Missouri, Kansas & Texas Railroad of the United States, more generally known as the "Katy" lines. Two miles south of McAlestor, Oklahoma, a southbound passenger train hit a drove of mules at a level crossing. The impact with the engine threw one of the mules into a switch-stand, with the result that the lever was jerked over, and the switch opened; the train was thus switched into a coal spur and wrecked, and a woman passenger was killed.



". . . and I asked him for two seats facing the engine, and HE said well, there's a war on, but he'd see what he could do . . ."

[Reproduced by permission of the proprietors of "Punch"

Coincidences

Curious coincidences occur at times to observant locomotive fans. Among recent experiences contributed by correspondents to our associated monthly, *The Railway Magazine*, one has been that of a traveller in an L.N.E.R. train, headed by "Director" 4-4-0 No. 5504, *Jutland*, which crossed the L.M.S.R. main line at Wembley at the precise moment when "5XP" 4-6-0 No. 5504, *Royal Signals*, was passing underneath with a freight train. Another correspondent writes of seeing L.N.E.R. Pacific No. 2553, *Prince of Wales*, standing with a Leeds and Bradford express at Retford down main platform, with "Director" 4-4-0 No. 5508, *Prince of Wales*, standing on the opposite side of the same platform at the head of a Cleethorpes to Manchester train.

* * *

Residents in the Quebec village of St. Hilaire, which has four railway stations, have applied to the Board of Transport Commissioners to prohibit the sounding of whistles, the ringing of bells and "other noises" made by engines and trains. The Board has declared that the inhabitants are subjected to an unusual amount of whistling at any time, and that this has been increased by the movement of wartime traffic, but that it is unable to make any specific order to reduce the sounding of whistles, in view of statutory obligations. However, the Board has had the locality inspected, and is conferring with the railway authorities in an attempt to find a solution.

* * *

Here Today, Gone Yesterday

The following story appeared recently in an Indian newspaper: An officer who had drawn his salary while on leave without the required civil surgeon's certificate was asked later by the Accountant-General's Office to produce evidence that he had been alive at the time. In vain he protested that, as he was alive now, he must have been alive when he drew his salary. The Accountant-General's Office preferred the regulations to the officer's reasoning, and insisted that, because he had drawn his salary for the last two months without a certificate, it was necessary for him to prove that he had been alive. Eventually, intervention by the higher authorities was required, before the officer could be released from the net of clerical regulations.

* * *

TAILPIECE

The Grantly Way

(An all-line operating school has been opened by the L.N.E.R. at Darlington)

If operating is your goal
You'll need to learn about control,
The proper marshalling of trains
By concentrated use of brains,
So go to Grantly.

For practical instruction too
In methods go-ahead and new,
For mastery of ways and means—
So very helpful in one's teens—
You go to Grantly.

Variety of information
Must count in railway operation,
And so for stimulative thought
'Tis obvious a student ought
To go to Grantly.

There, standing in and out of season
Upon the steady base of reason,
He'll quickly grasp essential themes
And maybe realise his dreams
By going to Grantly.

W. E. N.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

UNITED STATES

A New Carriage Seat

A new type of reclining chair for the equivalent of British third-class travel has been evolved by the Edward G. Budd Manufacturing Company of Philadelphia, and is being tried out on the line between New York and Miami, Florida, in the Silver Meteor coach streamliner of the Seaboard Air Line Railway. The foot-rest, in one position, serves as a hassock; it is pivoted on standards which may be raised a few inches from the floor, and can be swung back against the front of the seat so as to furnish continuous support of the legs and feet of the reclining occupant. At night this enables the traveller to sleep on his side or to curl up comfortably in a fully-supported position. Each leg-rest contains a pocket in which small personal possessions can be placed; the pocket is closed when the leg-rest is placed in either the up or the down position, thus assuring the safety of the contents. The arm-rest between each pair of seats is the same width as the outer arm-rest. The seat and the foot-rest together occupy 4 ft. 4½ in. of floor space, so permitting the seat to be tilted almost to the horizontal position for night use.

Grade Separation at Detroit

A costly grade-separation plan is to be carried out at Dearborn, a suburb of Detroit, Michigan, to avoid the present level crossing of the Michigan Central Railroad (subsidiary of the New York Central Railroad Company) and the Detroit Industrial Expressway. The eight tracks of the railway will be carried over the roadway by two skew spans, each 75 ft. 9 in. long, supported on concrete abutments and a column-and-girder type central concrete pier. The scheme includes a temporary diversion of the railway whilst the work is in progress, and alteration to the layout of the existing tracks at the site of the bridge. The cost of the scheme is estimated at $693,000.

Herkimer Grade-Separation

Typical of the cost of some of the major grade-elimination projects in the United States is that of $3,500,000 for the diversion of the New York Central main line through Herkimer, a town 80 miles west of Albany, New York State. The railway, which has four tracks, and carries many high-speed trains, passes through the centre of the town, and was crossed by seven important streets on the level. Efforts to eliminate these crossings began in 1903, but it was not until 1938, when legislation was passed to transfer the financial burden of such improvements to the State, except for a proportion up to a maximum of 15 per cent. levied on the railway in respect of improvement to its own property, that the Herkimer scheme was made possible. It has involved raising the railway on to a 25-ft. embankment to the south of the existing line (and shortening it by 513 ft.) for 3½ miles, extending the Adirondack Division line southwards for 2,300 ft. to join the new route, building a station and erecting a number of bridges and culverts. The largest of these is the bridge across West Canada Creek, which has a total length of 598 ft., and eight spans of 74 ft. or 75 ft. The relocation was carried out under an Order, dated November 2, 1939, of the New York State Public Service Commission, and the work was well under way before the United States entered the war. The present shortage of labour and materials, however, has caused an almost total stoppage of grade-separation projects on this scale for the duration of the war.

Derailment on Buckled Track

The Interstate Commerce Commission has issued a report on the derailment at Vaughn, Louisiana, on the Missouri Pacific Railroad, which occurred on July 19, 1943, and as a result of which a flagman was killed and a conductor injured.

The accident occurred on a section of straight single-track at the foot of a short 1 in 200 gradient, and the last four wagons and the caboose of a 48-wagon freight train were derailed by buckling of the rails. The temperature on the day of the accident had risen to 94°F. Contributory causes of the accident were that the cinder and gravel ballast between the sleepers over a considerable length of track at the site of the derailment had been removed for the surfacing of adjacent track and had not been replaced; and that because the affected length had no anti-creepers, the rails had crept and closed up the joints. The rails were of the 85 lb. per yd. flat-bottom section, and 33 ft. long, with 20 sleepers to a length, and had single-spiked soleplates (*i.e.*, one spike on each side of the rail at each sleeper). The speed of the train was 30 m.p.h. at the time of derailment, and, the I.C.C. report states, the condition of the track undoubtedly was responsible for the accident.

ARGENTINA

Professional Meetings

The sixteenth annual general meeting of the Argentine & River Plate Centre of the Institute of Transport was held in Buenos Aires on November 9. The Chairman of the Centre, Mr. G. C. Bonner, presided, and the meeting was attended by Mr. J. M. Eddy, a past Chairman, and founding member, of the Centre, and Mr. H. C. Drayton, a member of the parent Institute in London. After the Honorary Secretary, Mr. A. C. Wren, had read the annual report, the committee was elected for 1944 as follow: Messrs. F. A. Bottomley, E. A. Richards, R. V. Cable (Hon. Treasurer), F. C. Egerton, F. B. Lowry, A. T. Nickson, R. W. Walker, S. E. Warner, A. C. Wren (Honorary Secretary), C. Horton, P. Goddard, and A. Lowe. The Chairman expressed the pleasure it gave them to welcome among them Mr. Eddy and Mr. Drayton.

Mr. Eddy expressed the pleasure it gave him again to attend a meeting of the Centre. The Chairman recalled the early days of the Institute, its progress and the efforts of its members to keep abreast of the developments in the science of transport; he counselled the members to bear in mind the post-war problems they would have to face in connection with railway transport, and the great possibilities and opportunities which would be offered to them.

Mr. Drayton briefly referred to the great development in road construction and road transport which had taken place since his previous visit to Argentina in 1935, and he stressed the necessity for road and rail transport to be considered in relation to the whole transport system of the country, for which reason they should work in conjunction. After the conclusion of the speeches, two short films entitled "Diesel Working on the Railways" and "The Road of Tomorrow" were shown.

The annual general meeting of the River Plate Branch of the Institution of Mechanical Engineers was held in Buenos Aires on November 10. The Chairman of the Branch, Mr. P. J. Dawes, presided, and the meeting was attended by Mr. J. M. Eddy, who presented the prizes to students for papers read during the session. Mr. Eddy briefly addressed the students, and reminded them that they were being trained for a great profession, and that, as the years passed, the need for such institutions would become greater as the railways required more and more qualified men. The Chairman and committee were re-elected for the ensuing year.

Nationalisation of Port Works

An Argentine Government Decree issued on October 4, 1943, established that all buildings, machinery, and installations for the loading, unloading, storage, and transport of goods within port areas, which have been built on sites belonging to the State shall after 15 years, revert to the nation. All the buildings, equipment, etc., must be delivered up in good condition, subject to normal wear and tear. In the case of buildings, etc., at present worked under old concessions, the period mentioned shall commence as from the date of the publication of the Decree. The Government reserves the right to revoke the concessions or agreements at any time, by declaring the works as a public utility service. The Decree further establishes that vessels, lighters, etc., operating at private wharfs or moles, built within national port areas, shall pay the same dues as would be charged at Government wharfs. Private railways operating in port areas, where the Government maintains similar services, must charge tariffs fixed by law and pay the Government 30 per cent. of their receipts.

FRANCE

Giving Warning of Hot Boxes

The use of many foreign goods wagons, particularly Belgian, and the difficulties arising from shortage of materials and defective maintenance, have led to a large increase in the number of hot boxes on French railways. Occasionally fires have been caused, and considerable delays (especially, it is reported, on the electrified sections between Bretigny and Dax and Montauban and Narbonne) have been experienced. A new detonating signal apparatus, made by the well-known Paris firm of Ruggieri, has been tried on the above-mentioned sections to give lineside staff, such as gatekeepers, means of attracting the attention of guards of trains in which they may have noticed something amiss. Its working has proved satisfactory, and it is to be applied to the whole of the Orleans (Les Aubrais)-Montauban line.

The equipment consists of six detonators, which are not laid on the rails but are contained in a special combustible case or wrapper. The amount of explosive material in each is about the same as that used in an ordinary fog signal. A fuse is arranged to set off the six detonators at close intervals on being fired electrically from a battery on the pressing of a push-key or by the turning of a magneto. The wrapper is suspended from a post about 7 ft. above rail level at a short distance from the operating point and wired to the latter. On seeing a hot box, or anything else amiss, a gateman, platelayer or other employee must fire the warning as the guard's brake nears the apparatus, while showing the usual hand danger signals.

How Rails Break*

The commoner defects of rails which may lead to breakage, and some methods of prevention

By C. Dinsdale, B.Sc., Eng. (Met.), Assistant Metallurgist, L.N.E.R.

THE defects which cause rails to fail in service may result from either manufacturing or service conditions. Among the former are defects in ingots, or in rolling methods, or fractures caused by stresses set up in cooling, known as transverse fissures. Failures arising from service conditions may be caused by excessive wear; fatigue or impact; rail-end batter; corrosion in tunnels, at water troughs, or at wet ashpits; slipping by wheels; faulty heat treatment, welding or cutting; corrugation; or war damage.

Natural laws governing the solidification of ingots result in piping, segregation and blowholes. The contraction of the metal in the ingot as it solidifies produces a conical-shaped cavity at the top of the ingot known as the primary pipe; further minor contraction cavities may be present below the primary pipe, causing completely-enclosed or secondary piping. As the surfaces of the pipe are oxidised, they do not weld up in the rolling, and so may appear in the rail as vertical cracks. In service, the head and web of a rail containing a pipe splits open longitudinally, and this is indicated by cracks on the running surface or under the fishing angle. The chief protection against piping is for the steelmaker to discard sufficient of the ingot to clear it.

Segregation results from the fact that certain elements in the steel solidify at lower temperatures than, and are lighter than, the pure iron, with the result that they " segregate ", or concentrate in that part of the ingot which solidifies last, *i.e.*, the top and the centre. Segregation can be detected by taking a sulphur print of a section of rail, or etching with acid. In the U.S.A. the position in the ingot from which each rail is taken is distinctively stamped on it; in this country most works at least mark the top rail from each ingot, and at some mills top, middle, and bottom rails are marked in this way, when the usual three 60-ft. rails are being cut from each ingot.

As molten steel solidifies, gases often are evolved which collect in bubbles and form small cavities in the metal, known as blowholes. If their surfaces do not oxidise, they may weld up during rolling, but those near the surface are liable to oxidise or fill with iron oxide, producing seams in the rail surface. Other surface defects on the rails, called laps or laminations, may be produced by dirty ingot-moulds or splashing during the pouring of the molten metal; such defects are usually detected during inspection. Particles of slag or refractory material, trapped during casting, can be causes of fracture. Loose wash-plates used for the protection of the bottom of ingot-moulds during pouring have occasionally become loose, and floating upwards have become trapped as a mild steel inclusion in the solidified ingot, and have rolled out into the rail, forming a defect in the rail-end difficult to discover visually. Faulty roll design, chiefly with flat-bottom sections, may produce laps, folds and zones of strained metal at the junction between the web and the foot of the rail.

In 1929 a number of rail failures from this cause in India resulted in the inclusion in B.S. Specification No. 11 of an impact test on the side of the rail-head.

The transverse fissure is a progressive crosswise fracture starting from a crystalline centre or nucleus inside the head, from which it spreads outwards under traffic until fracture of the rail may occur. It is accepted that the chief cause is shatter-cracking in the head set up by internal stresses as the rail cools out on the bank after rolling; it is believed that hydrogen in the steel may play some part in the formation of shatter cracks. In the year 1928, Sandberg advocated that equalisation of temperature throughout the rail section and retarded cooling would prevent the formation of shatter cracks, and the method of retarded cooling adopted in that year at the works of the Cargo Fleet Iron Co. Ltd. is now applied at most British mills. After rolling, the rail temperature is equalised at a temperature of 550° to 500° C., and the rails are cooled slowly to below 350° C.

Of service causes of defects, one is loss of weight, which may result from the abrasion of the running surface, corrosion, chair-galling, or a combination of two or three. Wear capacity has been increased by changes in chemical composition, such as alloy steels containing 1 per cent. of chromium, or 1½ to 2 per cent. manganese, or the 12-14 per cent. heat-treated manganese alloy, or by heat treatments to rails of normal composition, such as the Sandberg sorbitic process.

A second cause is fatigue, which is the progressive failure of metal under repeated stresses. A high concentration of stress may be produced at one point in a rail section by misalignment; inadequate support; or such stress-raisers as sharp corners, sudden changes of section, tool marks, or corrosion pits. The crystals at these points slip and are thereby strain-hardened until they are no longer plastic, with the result that a fine crack is initiated. Stress is immediately concentrated at the bottom of this small crack, which under repeated loads grows and creeps across the section. A fracture so caused usually betrays itself by having a smooth area, produced by the gradual spread of the crack, where the two fracture faces have rubbed together, and a crystalline area, which is the part which suddenly broke when the remaining sound portion of the rail could no longer carry the load. Some engineers have imagined that the steel has crystallised as a result of fatigue, but this is not correct. It is the strength of the structure, rather than the strength of the steel, that deteriorates.

Shocks caused by the discontinuity of the rail at the joints, and the excessive stresses set up, are responsible for many failures. These may be horizontal cracks in the fishing at the ends, or cracks at the fishbolt holes, or cracks under the railhead at the joint chair, which have turned down symmetrically on each side of the chair through the web and the foot, finally causing breakage of the rail. Another rail-end trouble, chiefly with flat-bottom rails, is battering of the running surface at the joints. It is now a common practice to build them up by depositing weld metal, and to arrest the tendency to batter by heat-treating the ends, either at the rail-mill before delivery, or *in situ*, when the rails are laid, by portable plants. A still more effective solution is welding the rails into continuous lengths, or improved joints giving a continuous running surface.

In tunnels the principal cause of failure is corrosion fatigue. The moist and sulphurous atmosphere of the average tunnel, acting in conjunction with the cyclical stresses already considered under the heading of fatigue, greatly accelerate the damage to which the rail is subject. In some tunnels fishplate leverage, impact of the vehicle wheels and the large elastic flexion that follows have caused the localisation of abnormal stresses at the rail-ends and fishbolt-hole edges, where longitudinal and transverse fatigue cracks tend to open out. In other cases rail fractures are the result of fatigue cracks starting from corrosion pits in the rail foot.

Many attempts have been made to produce rail steel to resist such corrosive effects yet provide sufficient wear capacity, but the L.N.E.R. has found no advantage from copper-bearing steel, or copper-chrome, copper-manganese, 1½ per cent. manganese or certain other steels. Protective coatings have given much more promising results. On the L.N.E.R. the best results, relative to initial cost, have been obtained by painting the rails, while still warm after rolling, with a coating of red lead, followed by a coat of tar, which has reduced loss of weight in the proportion of 9·1 lb. per yd. with unpainted rails to 6·75 lb. per yd. with rails so coated. The same coatings, applied cold, reduced the loss to 7·20 lb.

So-called " wheel burns," from slipping driving wheels, accounted for ten broken rails examined in L.N.E.R. laboratories during the last year or so. Slipping, or the sliding of wheels too violently braked, generates intense frictional heat on the running surface, after which there is rapid cooling. As a result, martensite may be produced on the rail-head with a hardness up to 600 Brinell; this layer is very brittle, and as the rail bends under further traffic many cracks are formed which grow into the rail section as fatigue cracks.

Faulty heat treatments by railways themselves are responsible for a certain number of failures. These include the quenching in oil or water, by somewhat rough-and-ready methods, of crossing noses, in which there is no more accurate control of temperature than the use of a magnet, and the safeguard against such causes of failure is obviously better control. The same applies to the building up of worn point and wing-rails of crossings, although modern welding technique has brought considerable improvements. On the L.N.E.R. it is found that " wear-resisting alloy steel " electrodes, containing about 0·4 per cent. carbon, 0·6 per cent. silicon, 1·0 per cent. manganese and 1·2 per cent. chromium, are satisfactory; for the electric arc-welding electrodes containing about 1·2 per cent. carbon, 1·00 per cent. manganese and 1·8 per cent. chromium are used.

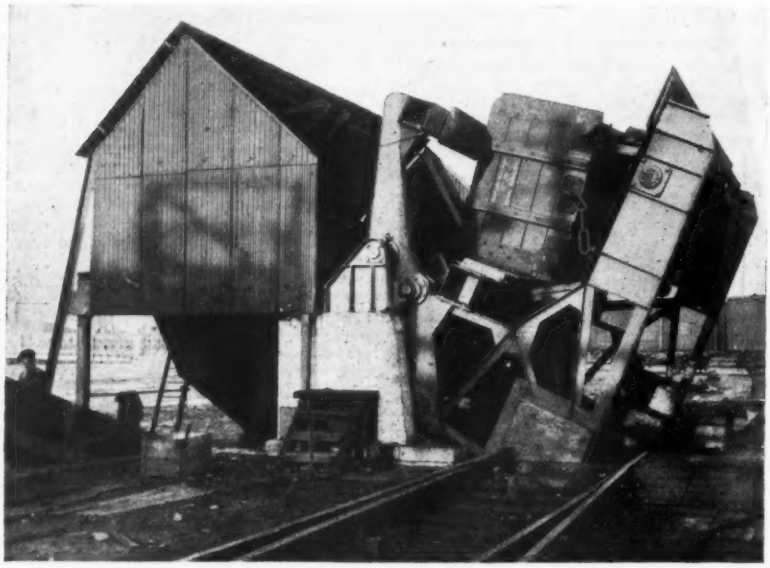
The problem of rail corrugation has not been completely solved. It consists of an uneven wear of the rail surface. The general conclusion is that the running surfaces of rails are overloaded with loads which vary more or less periodically in intensity. Decrease in wheel loads, increase in wheel contact area or contact area or improved quality of rail steel are other possible remedies.

* Summary of a paper read before the London Section of the Permanent Way Institution on February 19

Cargo Coaling Plants—III*

A detailed survey of the principles and installations involved in loading coal on board ship from railway wagons

By J. Dalziel, formerly Assistant Electrical Engineer, L.M.S.R.



Wagon side-tippler at Fleetwood

THE tippler is an integral part of the conveyor but the selection of one or other type is affected largely by the track layout and it is best therefore to deal with these together. A further reason for doing so is that accessory apparatus designed to accelerate wagon movement and reduce manual labour may be embodied partly in the track and partly in the tippler.

The full and empty roads serving conveyors, like those serving hoists and cranes, may be mainly laid out either at right angles to the quay face or parallel to it. However, the usual scheme for a large dock having a long quay face is for the tracks of each of a number of coaling plants to come down at an angle to the quay face so as to accommodate the tracks individual to each plant nearer to the main sidings, inside (that is nearer the quay face than) those of the succeeding plants. There must, of course, be at least two tracks individual to each plant, namely, a full wagon and an empty wagon road; generally there are more of both so that continuous feeding can be maintained.

Sometimes, more especially where the roads lie parallel to the quay face, the empty wagons proceed away from the plant along the same road and in the same direction of running as when coming forward as fulls; more often they must be returned more or less to where they came from as fulls, perhaps at a somewhat lower level. It is desirable to do as much of the necessary movement as possible by gravity. For quick working there should be no movement of the empty wagon back towards the next oncoming full over a common piece of track. Capstan work with its rope handling should be avoided because it is slow and requires manual work; also because loose ropes are undesirable where wagons and parts of the rail track have to be tipped.

There are two main types of tippler—the end and the side tippler. The end pattern requires wagons with end doors; the side tippler can deal with wagons of practically all types and of widely varying dimensions. In the crudest examples of the former, tipping is effected by a ram with a hollow head which engages with the axle of the wagon remote from the end door; the ram cylinder is fixed between the rails. This kind of tippler requires accurate placing of the wagon, thus leading to loss of time. Discharge takes place into a hopper below the rails, and in the process of discharge the coal has a considerable fall by which it is liable to be damaged, as also it may be from some of it striking the rails as it falls, more especially if these are continued over the hopper. No use can be made of the tipping device for getting rid of the empty wagon. Unless two tipplers are provided, a turntable must be used to get all wagons right way on for tipping. More frequently tipping is done by lifting the wagon on a section of the track used as a lifting cradle; there is then less need for accurate setting. If the wagon has to go on or forward when empty it will have to be "scotched" for tipping; this is generally done by hand. If, however, it can be arranged that the tipping cradle forms the extremity of the track, then the rails can be bent up as on a hoist to retain the wagons and an apron can be fitted to come up and form a path for the coal; this greatly reduces the clear fall and hence the breakage; it also ensures a hopper unobstructed by rails. The major axis of the hopper should lie in the direction of the main belt and be fitted with a feeder leading to the latter. Judging by what the writer has seen of such hoppers, there is some difficulty in getting the wagon emptied into the hopper quickly enough. Even if the hopper is wide the effective width is limited by the breadth of the wagon and the effective length by the angle of repose of the coal which piles up in front of the wagon until drawn off by the feeder. Where the serving tracks come down at right angles to the quay face this arrangement can work with a minimum of wagon movement operated either by capstan or by tilting-devices-cum-capstan as described elsewhere. The turntable which is essential to any end tippler adds several movements.

Where tracks lie parallel to the quay face the turntable serves not only to place the wagon right end first, but also to divert the wagon to and from the short (or "stub") track which terminates in the tippler. Here again wagon movement may be operated by capstan or by a tilting device on the turntable with a capstan for return movement and for rotating the turntable. There must also be movements on and off both full and empty weighing machines. Gravity may be utilised in at least one direction of movement. There is an appreciable loss of height of the coal with any form of end tippler; this must be paid for by a corresponding increase in the lift to be given by the main belt which in consequence must be made longer. However, the peak power demand is much less with an end than with a side tippler.

The roll-over side tippler is slow and badly adapted to deal with varying wagon sizes; it also requires a pit under the rails and involves both a considerable drop of the coal and its hitting obstructions. The action of the side tippler proper is to lift the wagon bodily up and sideways on a cradle which is compound pivoted, to swing it over through about 55°, and to discharge it into a hopper placed above ground at the side of the rail track. The action of the cradle is first to tilt the wagon slightly over to rest its inner side against a padded retaining beam, and then to clamp it in position on the rails by means of one or more retaining bars engaging with the top of the wagon, generally in the middle and along the side remote from the hopper. This type of tippler has several advantages; it can deal with any wagon whether with or without end doors; it does not absorb height; it lends itself to arrangements making for very rapid wagon handling in which there is no back movement of the wagons over the same tracks, and, lastly, it minimises breakage. With side tipplers the track layout of various conveyors with which the writer was associated is as follows. Full wagons in a raft of up to a dozen 12-tonners are hauled up tracks graded 1 in 90 to the full-wagon weighing machine by 5-ton capstans. Where there is one capstan per track, haulage is of the main and tail type; the bollard is spirally grooved and it carries double ropes; the idle one winds off the bollard as the working one winds on. At the far end the two ropes each terminate in a hauling hook but they are coupled together by a lighter rope which passes round a spring-loaded sliding bollard to keep them taut. There is thus no paying out movement. Where one capstan serves two tracks this arrangement is not feasible and the capstan, which has a very low hauling speed, namely, 60 ft. per min., is fitted with a change-speed gear to give a rope pay-out speed of 180 ft. per min. To give sufficient power for hauling out the heavy rope a short plain-face auxiliary bollard is fitted

* Previous parts appeared in our issues of January 7 and February 11

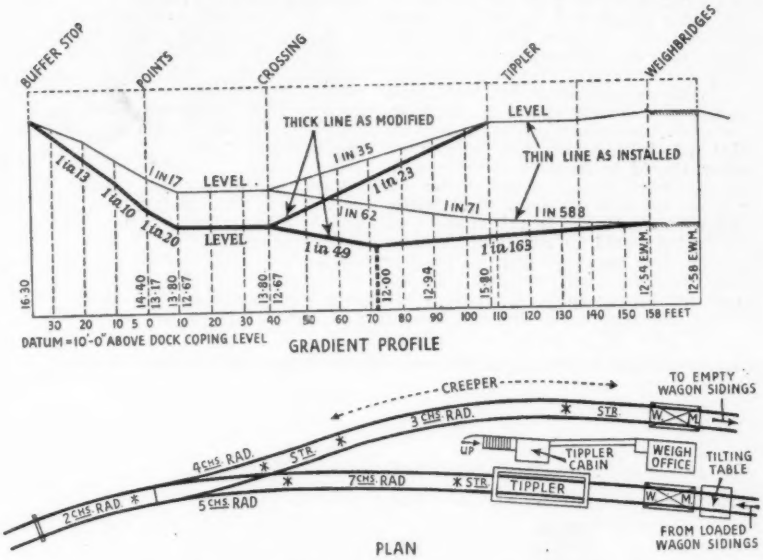
on the top of the main bollard. The latter, though not double roped, is spirally grooved as in the double-rope cases to ensure the heavy rope winding on without overlap of turns. The double rope scheme is much the better of the two; one rope is always ready for attachment to the new raft of wagons.

The low haulage speed of these capstans is quite sufficient as the movement required is only that of one wagon length at a time, and the time interval available for this movement is nearly all that of a complete cycle of tipping and emptying the wagon that has gone before and returning it to ground level. The capstan places the leading wagon on the full-wagon weighing machine, where it is stopped by a lever-operated scotch. To ensure clearing the buffers of the wagon next behind, either a short piece of track just back from the weighing machine is graded downwards, so that the leading wagon runs away from the one behind or the 1 in 90 gradient can be continued up to the weighing machine, and the capstan (which was fully described in the capstan article by the writer in *The Railway Gazette* of July and August, 1937) can be reversed slightly to allow the raft to fall back for a foot or so. The former is preferable as putting less wear and tear on the capstan controller. The rails of the weighing machine are carried in a cradle which, when weighing is completed, is tilted by an electrically operated winch; the wagon then rests against the aforementioned scotch. When the preceding wagon, then on the tippler, has been returned to ground level empty, the scotch is withdrawn by its lever and the wagon is allowed to run forward under the impetus imparted by its tilt, whereupon it knocks the empty wagon off the tippler. To stop the oncoming wagon on the tippler the wheels are engaged at the appropriate moment on each side of the tyres by a retarder or clamping device which is actuated by a compound lever in charge of the tippler operator. This lever takes up the slack on one purchase and applies final pressure for stopping with a greatly increased purchase, as in the application of compound wagon brakes. The clamping blocks engage both sides of the tyres; they should do so as high up on the periphery of the wheel as possible.

The retarder blocks should be released when the wagon is stopped but the actuating mechanism allows for satisfactory disengagement of the parts that rise with the tipping cradle from those that are fixed; also for their re-engagement on descent of the cradle. From the tippler onwards the track becomes the empty road; it dips steeply on a gradient of about 1 in 25 which is followed by a short length of level past points leading back to the return empty road; thence there is an up gradient varying from 1 in 20 to 1 in 10, forming a switchback at the end of which lie the buffer stops. On this the wagon reverses to pass over the points and along the "empty" road which falls for a short distance and is then upgraded gently to the empty weighing machine which is at a level of rather more than 3 ft. below the tippler table. This fall together with the impetus imparted to the empty wagon by the oncoming full one, is enough to ensure that a wagon with normal lubrication will run down to the empty weighing machine and pass over this slowly, eventually running away down the empty-wagon sidings, which are graded at about 1 in 100 overall.

With grease-lubricated wagons in a neglected state this switchback scheme is insufficient by itself; the gradients were originally gentler and some of the worst of these wagons failed to reach the empty-wagon weigher and in some cases even to clear the crossover points; however, the steeper gradients used afterwards ensured that they at least cleared the points; to carry them forward up to the empty weigher a creeper chain was installed in the middle of the up-graded "empty" track from the points; this had pushers which engaged with the axles and carried the vehicles forward. The pushers could move out of the way when fast free-running vehicles overtook them from behind. The creeper stopped short of the empty weigher, but the track beyond, also the rails of the weigher, were graded to ensure that the wagon ran and stopped correctly for weighing. Each wagon was pushed off the weigher by the next oncoming one under the influence of the creeper; once started a wagon found itself on the steep gradient of further full ones. Lines at right angles to the quay face require somewhat different treatment and in general there cannot be the same uni-directional and unobstructed movement.

The tippler should be able to deal with wagons varying in length, width and height from a minimum of 17 ft. 11 in., 7 ft. 5 in., 6 ft. 10 in. and up to the dimensions of a standard 20-ton wagon. It should be capable of handling up to 50 wagons per hr. and it must not do damage to wagons such as crushing the sides or bending the hinge bars. To this end localisation of the clamping pressure must be avoided; such localisation takes place, for example, when a rope-padded side bar engages with a projecting nut or bolthead or a reinforcing bar; to obviate this soft thick pads of special rubber (which absorb such projecting parts without damage to themselves and distribute the pressure) should be used instead of, or supplementary to, rope padding. Similarly, overhead clamping bars should engage with the ends and sides of the wagon at as



Plan and grade profile of tracks serving a cargo-coaling plant

and ran clear. With the steeper gradient from the tippler free-running wagons attained a speed which was not sufficiently checked by the up grade of the switchback to present somewhat violent collision with the buffer stops. This fault was corrected by a track retarder in the form of a sliding shoe on the rail on to which one of the leading wheels of the wagon ran at some distance up the graded track. The shoe was then carried forward with the wagon the wheels of which it locked and braked. After being stopped, the wagon ran back off the shoe, and this, being counterbalanced, also slid back down the grade to its original point of engagement.

This track layout gives maximum speed of wagon handling with minimum manual work; as described it applies mainly to lines parallel to the quay face. It will be seen that wagon movement up to the tippler is uni-directional and that the tippler is clear to receive a fresh wagon the moment the preceding one is returned to ground level empty. This is because the empty wagons pass onwards instead of coming back to obstruct the movement

many points as possible to distribute the weight as far as possible equally between them; otherwise hinge bars will be bent and the top of wagon sides crushed. Furthermore, these bars should also be applied in such a way that they permit springs to decompress when relieved of the weight of the coal; they must not themselves impose pressures equivalent thereto; they must, however, keep the wagon wheels in engagement or at least in register with the rails.

Some tipplers used single clamping bars placed longitudinally on the tops of the wagons. These were responsible for the bending of hinge bars. Other tipplers used two overhead clamping bars placed across the wagon; these engaged with the sides and not the ends so that they avoided hinge-bar trouble, but the clamping bars were badly in the way of a clean discharge of the coal and in a number of cases damage was done to the top planks of the wagon sides. In some cases also the metal facing strips running along the top sides were bent and the nails securing them pulled out, so that the strips became detached; sometimes they

fell into the hopper. These were serious troubles; consequently the cross bars were finally replaced by two longitudinal bars one of which clamped down the centre of the wagon and the other engaged with the corners and top of the side remote from the hopper. This almost eliminated damage.

It happens, of course, that a good many private-owners' wagons are in poor condition, so that in addition to the facing strips mentioned above it is not infrequent for bottom boards to fall into the hopper. In tipping, brake lever pins tend to fall out and allow the brakes to drop into the "on" position; it is therefore desirable to lock them "off" by engaging them with an extension of the side bar or cushion. Door catches should likewise be so engaged as to prevent their disengaging and allowing the door to fall.

There is another trouble experienced with the side tippler which cannot be overcome by any improvement in its construction, namely, spillage of oil from the wagon axle boxes. Provision can be made for catching this oil and guiding it to a sump which can be drained from time to time. Wagons fitted with the inkwell type of axle box are to a great extent free from this oil-spillage trouble. To provide against spillage of coal round the corners and ends and down the sides of wagons, and to turn it into the hopper, strips of belting, or soft rubber or leather, should be fixed so as to form an approximately circular hollow section on or above the side cushions. Stiff bristle brushes are also useful in this connection. The tippler should be counterbalanced to minimise the peak power load and it should be fitted with an apron over the lip of the hopper on to which falls the first of the coal being discharged from the wagon, so as to form a cushion. One form of tippler gives the wagon a transverse movement over the hopper as it discharges so as to distribute the coal; this is an advantage.

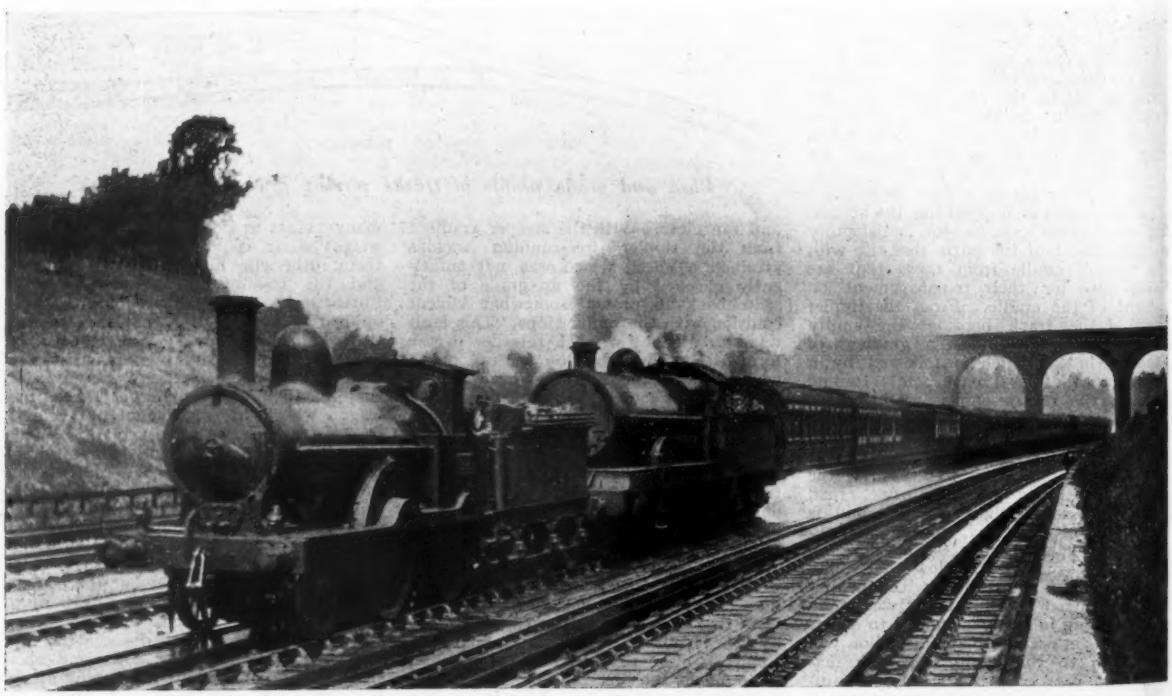
In nearly all cases there is a tendency for lump coal from the upper side of the wagon as it comes over to be thrown into the hopper with a considerable and damaging fall. This can be obviated by enclosing the upper half of the wagon; the device for doing so is fitted on the retaining beam of the tippler. Its lower portion is arranged on guides and rollers so that it is closed down on the coal as the wagons come over and tipping commences. It allows the coal to pass down into the lower half of the wagon and thence into the hopper over the apron mentioned above, thus eliminating drop.

The apron tilts to discharge the coal into the hopper as tipping proceeds and is hinged to ensure that the drop into the hopper shall be a minimum. The tippler should ensure that as far as possible the outflow lip of the wagon is in the same position relative to the apron whatever be the height of the wagon. With some forms of tippler there may be a considerable drop. The satisfactory reception of the coal in the hopper is difficult to ensure as allowance must again be made for the different angles of flow of fine and lump coal.

Cushioning by rubber baffles should be resorted to as far as possible at the bottom of the hopper but the best scheme for practical purposes is to ensure that tipping takes place into a hopper always well filled, making it large enough to allow for this, that is of capacity well over the contents of the wagon. For this and other reasons the operator's cabin should be elevated and positioned so that the operator has a good view into the hopper. There should be access to the bottom of the hopper at the point of exit to the feeder for clearing jams, and spring-mounted plates should be provided so as to guide exceptionally large lumps and make them travel with their longitudinal axis along the belts. Similar plates should be provided wherever there is any change in direction of flow.

The tippler is operated independently of the conveyor proper but not entirely by itself. Its operator should control the tilting frame and its scotch on the weighing machine, the retarder on the tippler, the tippler itself, and the feeder leading from the hopper. The latter, however, should be interlocked with the main boom, and any other subsequent belts so that in the event of any of these stopping or being stopped the feeder also stops so as to avoid coal being fed on to a stationary belt. The belts themselves should be similarly controlled so that the stoppage of any belt automatically stops all those behind it. It should be mentioned that in general each belt as well as each individual motion is driven independently. The conveyor proper is best controlled in all its motions from a cabin placed on the end of the boom, and giving a view into the ship's hold as well as views of the action of the chutes, distributors, and so on. Visibility may be impaired by coal dust; for this reason there is sometimes fitted a tell-tale plate on to the final chute or distributor so that when the level of the coal in the hold comes within a certain short distance of the bottom of the chute or distributor, this is indicated in the driver's cabin by a light.

(To be continued)

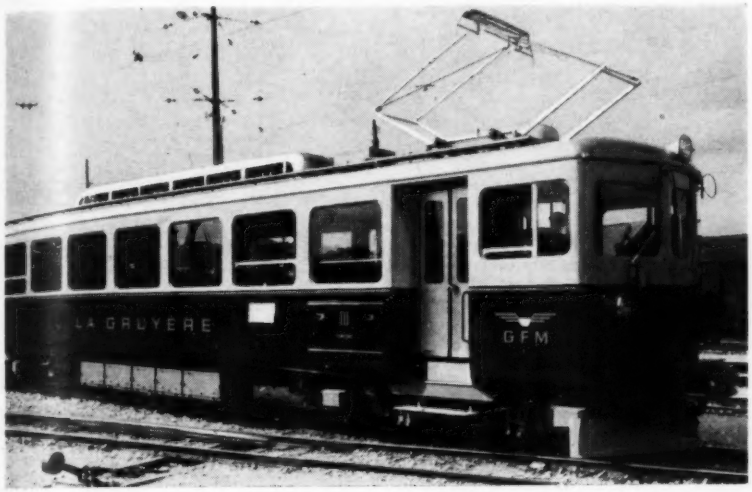


Up Liverpool express shortly after formation of the L.M.S.R. "Jumbo" 2-4-0 locomotive No. 824, Adelaide, piloting "Claughton" 4-6-0 No. 650, Lord Rathmore

Photo [*H. Gordon Tidey*

New Equipment on Swiss Fribourg Lines

Modern electrical equipment, signalling and other improvements for accelerated services



AN appreciable improvement in passenger services was effected in September last by the Chemins de fer Fribourgeois G.F.M. (Gruyère—Fribourg—Morat) by the introduction on its Gruyère metre-gauge section of new light-weight trains running on accelerated schedules between Bulle, Châtel-St. Denis, and Palézieux, and between Bulle and Montbovon to the previous timings. The best times have been reduced from 40 to 32 min., between Bulle and Châtel-St. Denis in each direction, 19·5 km. (12 miles), and from 16 to 13 min. from Châtel to Palézieux, 6·8 km. (4·2 miles), and 17 to 15 min. in the reverse direction, including stops at all stations but omitting halts. The stop at Châtel-St. Denis (where trains reverse) was formerly of 6 to 7 min. to enable the motor-coach to run round the train, but now has been reduced to 3 min.

In preparation for the new trains, track improvements have been carried out for some time, and the overhead contact wire converted from simple to catenary suspension. Colour-light signals have been installed at several stations.

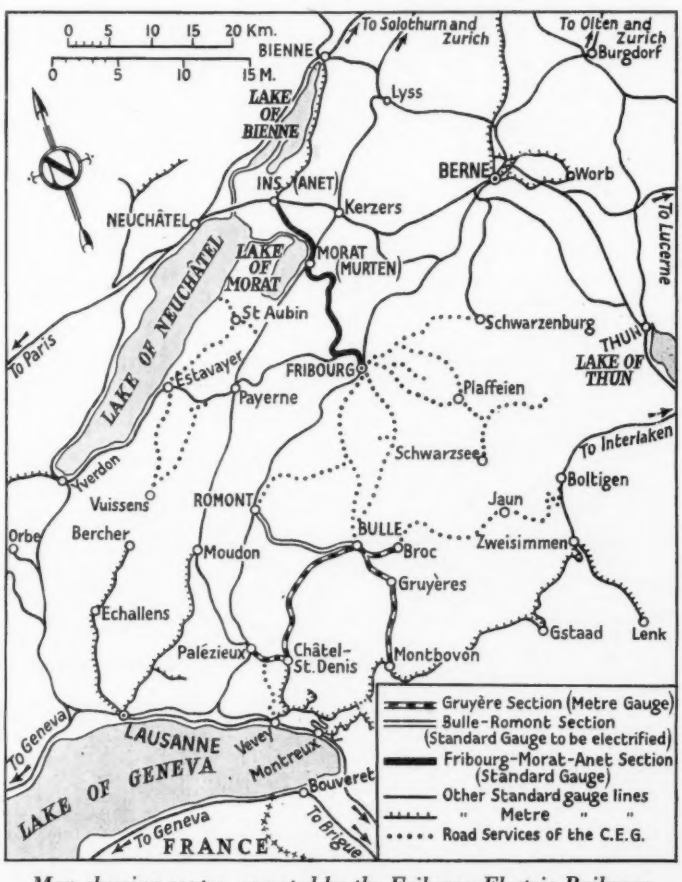
The former passenger rolling-stock, most of which dated from the opening of the line in 1901-04, consisted of 13 bogie motor-coaches and 20 4-wheel trailers, with a total seating capacity of 1,024. The new trains are on the multiple-unit principle (a novel departure for Swiss metre-gauge lines) and consist in all of 3 motor-coaches and 4 driving trailers. They have grass-green lower and pale-green upper panels instead of the overall green of the older stock, with the new crest of the Chemins de fer Fribourgeois near one end and the name "La Gruyère" (indicating the section of the system) in large lettering in the centre.

The motor-coaches, built by Brown Boveri and the Schlieren Carriage Works, can maintain a speed of 40 km.p.h. (25 m.p.h.) on a 1 in 29 gradient with a 100-*tonne* load, and reach a maximum of 75 km.p.h. (47 m.p.h.) on level stretches. With an overall length of 16·7 m. (54 ft. 9 in.) they weigh 28 *tonnes* (8 *tonnes* for the electrical equipment) and are of welded-steel construction, with welded bogies of the latest Schlieren type, giving very smooth riding and requiring little maintenance. The bogies subsequently can be fitted with magnetic-track brakes should these trains have to run over the severely-graded Montreux—Oberland route (with which the Gruyère line connects at Montbovon). Each bogie has two 138-h.p. motors, coupled in series. Current is taken at 900 volts d.c. through a single pantograph with double contact strips.

The multiple-unit control circuits are energised from a 32-volt circuit, fed from cadmium-nickel accumulators charged from a converter set, and actuate a camshaft controller by electro-pneumatic mechanism, with automatic acceleration and brake control, ensuring maximum rapidity and smoothness, whether in starting or stopping. The total weight of the control equipment on a motor coach is 370 kg. (816 lb.).

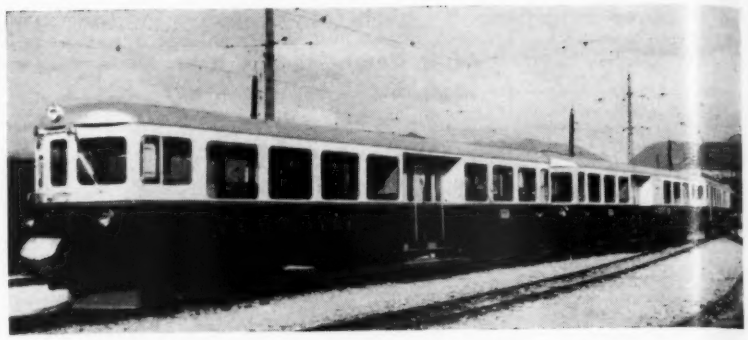
The driver is seated on the right-hand side of the driving compartments and has pneumatic control of the motor-coach doors; a mirror enables him to observe the other side of the train. Accommodation is provided for 60 passengers in two compartments, one of which is considered as second class if required, and indicated accordingly by reversible plates outside. The interior arrangements are the same throughout, with wide windows, artificial leather-upholstered seats and tubular luggage-racks. The coaches are entered by closed platforms between the passenger and driving compartments; a door in the latter connects them with the trailers.

There are two types of trailers: one seats 58 passengers in two compartments and weighs 15 *tonnes*, the other, which weighs 16 *tonnes*, seats 32 passengers in two smaller compartments and has also



Map showing routes operated by the Fribourg Electric Railways

a postal compartment. In both cases there is a driving compartment at one end only, and a central entrance platform with double doors on each side. These coaches have wood bodies mounted on steel underframes, to economise material, but their general appearance is similar to that of the motor-coaches, as is also the passenger accommodation. One compartment in each coach is interchangeable as first or second class. Both motor-coaches and trailers are heated from the traction current; the lighting is fed from the low-tension circuit in the motor-coaches and the traction circuit in the trailers, with blackout lamps in addition to the normal ones. The Hardy vacuum brake is used.



New light-weight train seen from driving trailer end, Fribourg Electric Railways

A Notable Electric Train Service

The Pennsylvania Railroad runs 100 trains daily over 76 miles of its electrified main line at a general average of 60 m.p.h.

The recent derailment of the Advance Congressional, fastest train on the electrified Pennsylvania main line between New York and Washington, calls attention to the remarkable speeds maintained over this route, which for its length can claim easily to carry the fastest and most frequent train service in the world. The advertised service consists of 48 trains daily, which include only one advertised duplicate—the Advance Congressional—though other additional sections are frequently run. With the exception of the Edison sleeping-car train, which is deliberately run at a lower speed so as not to arrive inconveniently early, the entire service averages 4 hr. 5 min. for the journey of 224·8 miles, and so has a mean speed of 55 m.p.h., including all stops. Departing from both terminals at times from 6.30 a.m. to 9 p.m. there are 36 trains at an average overall speed of 56·8 m.p.h.

The fastest train is the northbound Advance Congressional, at 4 p.m. from Washington; this alone is non-stop over the 214·8 miles to Newark in 3 hr. 15 min. (66·1 m.p.h.), and reaches New York in 3½ hr. (64·2 m.p.h.). The Congressional in each direction is allowed only 3 hr. 35 min. (62·7 m.p.h.) inclusive of stops at Newark, Philadelphia (North and 30th Street Stations), Wilmington, and Baltimore.

In the case of all trains other than the Advance Congressional and the southbound Edison sleeper (non-stop over the 184·7 miles from New York to Baltimore), all the five stops just mentioned are made by every express, and some call in addition at Trenton, New Brunswick, and other intermediate points. Of point-to-point runs the fastest are made by the Congressional, which southbound is booked over the 76 miles between Newark and North Philadelphia in 65 min., and northbound in 64 min. (70·2 and 71·3 m.p.h. respectively from start to stop).

Throughout the day, at 6.30 a.m. to 11.30 p.m. from New York, and at 7 a.m. to 9 p.m. from Washington, the express service runs at even hourly intervals, with certain additions, which are chiefly the through trains to and from Boston, run in conjunction with the New York, New Haven and Hartford Railroad via Hell Gate Bridge. The hourly trains all carry names suggested by the activities of Washington, such as the Congressional, Senator, Legislator, President, Judiciary, Representative, Executive, Speaker, Constitution, Embassy, Patriot, and Potomac.

All day trains carry parlour, parlour buffet, and dining cars as well as coach accommodation, and many of them are made up to considerable weights; formations up to 16 cars, with a gross weight of 1,200 to 1,250 tons, are common. On certain services these loads are due to the fact that through sections for the southern and south-western states, via the Seaboard Air Line, Atlantic Coast Line, and Southern Railway routes, are attached to the hourly New York—Washington trains, but certain of these through trains, such as the Silver Meteor, Tamiami Champion, and other principal streamline trains to and from Florida, are run independently at the same speeds over the entire route, and are additional to the 48 Pennsylvania daily trains already mentioned.

Between New York and Philadelphia the express service is much more intensive, as it includes the long-distance trains to and from Pittsburgh, Chicago, Cleveland, and St. Louis, hourly express trains between New York and the Broad Street terminus at Philadelphia, and hourly stopping trains, all of which use the same metals from New York as far as North Philadelphia, 80 miles. The hourly Philadelphia expresses alternate with the Washington trains by leaving New York on the hour from 7 a.m. to 11 p.m.; they return on the hour from 7 a.m. to 10 p.m. These trains also carry dining cars in addition to parlour cars with buffet grills.

Including the services to and from Philadelphia, Washington, and Harrisburg, Pittsburgh and points west, in the 19 hr. daily between 6.30 and 1.30 a.m. southbound, and between 7 and 2 a.m. northbound, a total of 80 trains daily covers the 76 miles between Newark and North Philadelphia in less than 80 min., 12 non-stop, and the remainder with from 1 to 4 intermediate stops. Thirteen of the trains take from 70 down to 64 min. for the run. The average journey time is 74½ min. for the 40 southbound trains, and 72½ min. for the 40 northbound; the mean average for the entire 80 trains is 73½ min., which works out at 62·1 m.p.h. Included among the expresses using this section are the famous Broadway Limited and the all-coach Trail Blazer on the Chicago service, the Spirit of St. Louis and Jeffersonian on the St. Louis service, and many others, all of which are electrically hauled over the 189 miles between New York and Harrisburg. In the whole 24 hr. about 100 trains in all maintain an average of 60 m.p.h. between Newark and North Philadelphia, intermediate stops included. Power is provided almost exclusively by the well-known "GG1" type streamline electric locomotive of the 2-C$_2$-C$_2$-2 (4-6-6-4) type, taking current at 11,000 volts a.c. from overhead conductors.

RAILWAY ELECTRIFICATION IN SPAIN.—It is stated that the following lines will be among the first to be converted under the twelve-year plan for the electrification of some 2,500 route-miles of railway in Spain, brief reference to which was made in our issue of September 10, 1943 :—

	Miles (approx.)
Barcelona—Empalme—Cerbère...	120
Barcelona—Roda—Reus	80
S. Vicente de Caldas—Tarragona	20
Roda de Bara—Picamoixons	25
Manresa—Lerida	70
Tarragona—Castellon—Valencia	170
Guadix—Almeria	75
Madrid—Baeza—Espeluy—Cordoba	270
Espeluy—Jaen	20
Cordoba—Malaga	110
Cordoba—Peñarroya	50
Baeza—Moreda	60
Moreda—Granada	30
Avila—Medina del Campo	50
Segovia—Medina del Campo	50
Castillejo—Toledo	30
Bilbao—Miranda de Ebro	60
Santander—Palencia	130
León—Betanzos—Coruña	230
Betanzos—El Ferrol del Caudillo	30
Total	1,680

These lines are shown on the map published in our September 17, 1943 issue

In addition to the lines given in the table above, the steam-operated sections of the Gijon-Leon route are to be converted, and will provide for through electric working between those points.

From Four Cylinders to Two

A 4-6-0 type engine, formerly of the Great Central Railway, is rebuilt by the L.N.E.R. with standard boiler and cylinders

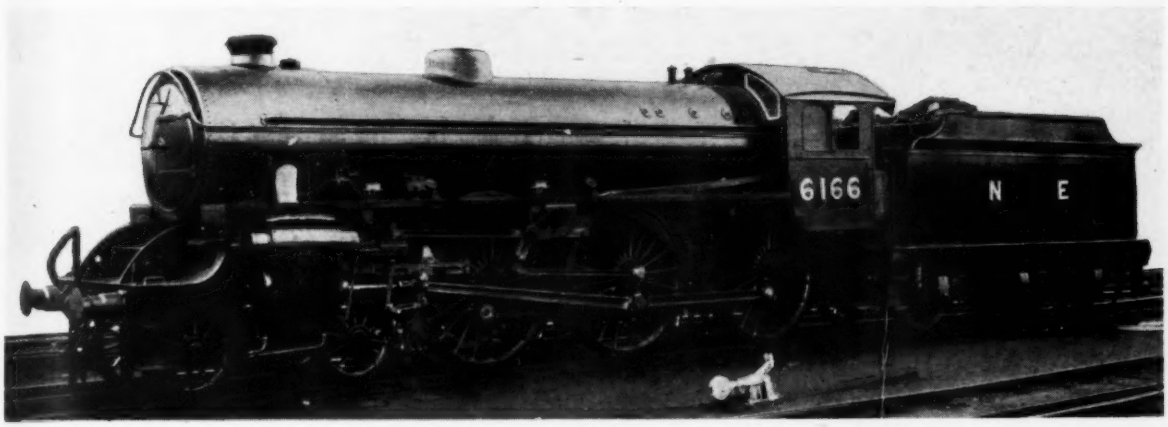
ONE of the six 4-6-0 class "B3" locomotives of the L.N.E.R., originally built by the former Great Central Railway during 1917 to 1920 with four cylinders and piston valves actuated by Stephenson link motion, recently fractured its cylinders. The opportunity was taken to rebuild the engine with two cylinders similar to those used on the class "B1" mixed-traffic 4-6-0 locomotives and with the "B1" type of boiler, thereby eliminating cylinders and boiler of non-standard design. The engine thus converted is No. 6166, originally named *Earl Haig*. With No. 6168, *Lord Stuart of Wortley*, this engine was fitted with Caprotti valve gear in 1929 and reclassified "B3/2."

The present rebuilding has not altered the maximum boiler barrel diameter, which remains 5 ft. 6 in.; the barrel length, however, is reduced from 17 ft. 3 in. to 13 ft. $11\frac{7}{8}$ in. Other changes are shown in the table below.

The piston valves in the rebuilt engine have a diameter of 10 in. and a maximum travel of $6\frac{5}{8}$ in. + $\frac{1}{32}$ in. The steam lap is $1\frac{1}{8}$ in. and the cut-off in full gear is 75 per cent.

As our illustration shows, there has been a considerable alteration in the appearance of the engine; the running platform has been raised so high that the splashers have been reduced almost to vanishing point. However, these very small splashers are sufficient to distinguish the engine at a glance from those of the "Antelope" class, which have no splashers at all, and driving wheels of only 6 ft. 2 in. dia. instead of 6 ft. 9 in. as in the engine that forms the subject of this article.

	Before rebuilding	After rebuilding
Cylinders, No.	4	2
,, dia.	16 in.	20 in.
,, stroke	26 in.	26 in.
Evaporative heating surface, tubes	1,881 sq. ft.	1,508 sq. ft.
,, ,, ,, firebox	163 sq. ft.	168 sq. ft.
Total	2,044 sq. ft.	1,676 sq. ft.
Superheating surface	343 sq. ft.	344 sq. ft.
Combined total	2,387 sq. ft.	2,020 sq. ft.
Grate area	26·0 sq. ft.	27·9 sq. ft.
Boiler pressure, per sq. in.	180 lb.	225 lb.
Tractive effort (at 85 per cent. boiler pressure)	25,145 lb.	24,556 lb.
Adhesive weight	128,240 lb.	119,504 lb.
Adhesive factor	5·1	4·87
Weight of engine in working order	79¼ tons	71¼ tons



General view of rebuilt locomotive which includes many standard parts

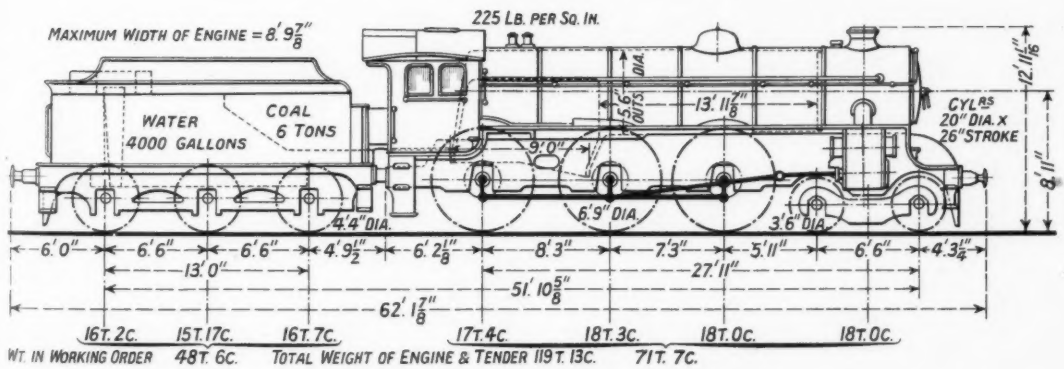

MAXIMUM WIDTH OF ENGINE = 8′ 9⅞″
225 LB. PER SQ. IN.
WATER 4000 GALLONS
COAL 6 TONS
5′6″ DIA. OUTS.
13′ 11⅞″
9′0″
CYLRS 20″ DIA. X 26″ STROKE
12′ 11⅞″
8′ 11″
4′4″ DIA.
6′9″ DIA.
3′6″ DIA.
6′0″ 6′6″ 6′6″ 4′9½″ 6′2⅛″ 8′3″ 7′3″ 5′11″ 6′6″ 4′3¼″
13′0″
27′11″
51′10⅝″
62′1⅞″
16T. 2C. 15T. 17C. 16T. 7C. 17T. 4C. 18T. 3C. 18T. 0C. 18T. 0C.
WT. IN WORKING ORDER 48T. 6C. TOTAL WEIGHT OF ENGINE & TENDER 119T. 13C. 71T. 7C.

Diagram giving principal dimensions and axle loads

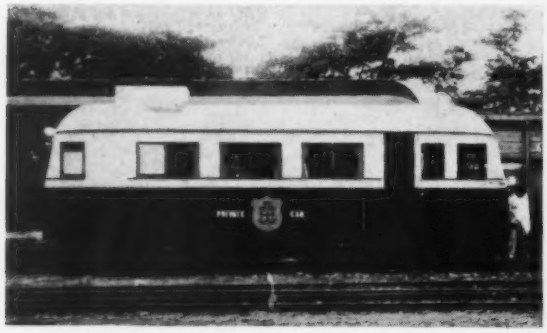
ARGENTINE RAILWAYMEN AID RED CROSS.—The non-British staffs of the Buenos Ayres Great Southern Railway, the Buenos Ayres Western Railway, and the Buenos Ayres Midland Railway, which had already raised a sum equivalent to over £37,000 for British Red Cross funds, have now collected an amount equivalent to about £3,500 for the purchase of foodstuffs to be distributed among prisoners-of-war. This money is estimated to be sufficient to support 200 prisoners for one year.

NEW EXPRESS PASSENGER TRAINS IN SPAIN.—A fast passenger train, the Catalonian Express, consisting of sleeping cars and first and second class coaches, was placed in service between Madrid and Barcelona at the end of last November. The train leaves Madrid on Tuesdays, Thursdays and Saturdays at 7 p.m., and arrives at Barcelona the next morning at 9.45 in each case. Departure from Barcelona is on Monday, Wednesday and Friday evenings. Another fast train (daily), consisting of sleeping cars and first class coaches, was introduced at the same time between Madrid and Valencia; and the operation of a train to carry second and third class passengers only is under consideration.

The Jamaica Government Railway

Some account of recent rolling stock additions and civil engineering works which are helping to cater for war traffics

IN our issue of June 18 last we published an article describing briefly the Jamaica Government Railway and its history. As we then pointed out, the Government system comprises all the lines in Jamaica; and during the present period of restrictions on road transport it is carrying the majority of the island's traffic. Despite the difficulty of obtaining spare parts to keep older locomotives and equipment in order, it has succeeded in dealing with all business offering. As an example of the volume of the latter, general merchandise traffic has increased since the beginning of the war by 700 per cent.; and we have received from the General Manager & Chief Engineer, Mr. H. R. Fox, some details of measures which have been taken to meet this and other considerable increases.



Exterior view of the petrol-driven private railcar which is used by the Governor of the Island, and also for inspection trips by the General Manager & Chief Engineer of the Jamaica Government Railway. The railcar was designed and built in the railway workshops by Jamaica railway staff

Interior of railcar. Mr. H. R. Fox, General Manager & Chief Engineer, is on left

In view of the shortage of fuel, twelve main-line locomotives have been converted to burn wood, a very suitable type of which is possessed by the island. On this fuel the engines concerned have operated with success over all the mountain sections of line. To reduce consumption of petrol and wear on tyres, the railway carries road tank-lorries, from Kingston outwards, on flat wagons. It operates also a coastwise steamer service to the many out-ports around the island.

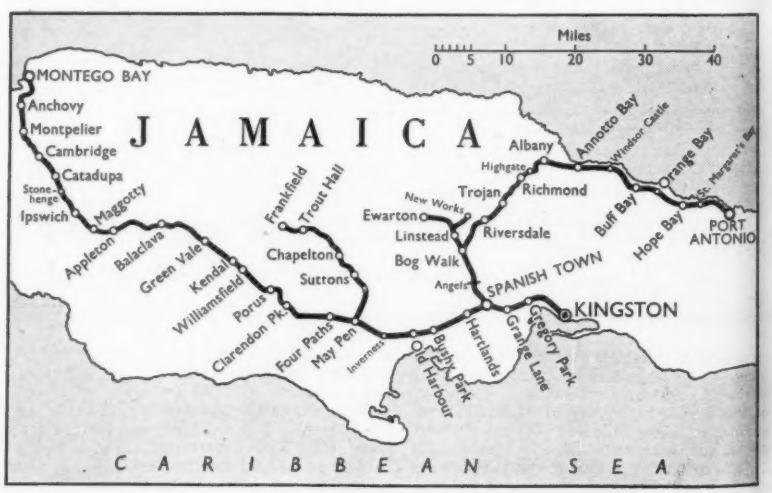
Four "austerity" locomotives, built in the U.S.A., have been acquired; of these, two are of the 2-8-0 type, and two are shunting tank-engines of the 0-6-0 type; they are similar, respectively, to the U.S.A.-built "austerity" types supplied to Great Britain. The rigid wheelbases (15 ft. 6 in.) of the 2-8-0 locomotives, the boilers of which are built with sufficient flexible stays for oil conversion, compare with those of 13 ft. 6 in. of the principal main-line engines of the Government Railway. The "austerity" locomotives have passed successfully exhaustive tests, involving negotiation of the heaviest gradients and sharpest curves; that is to say, from 3¼ per cent. to 4 per cent. in the case of the former; and 17½ deg. reverse curves, probably sharpened up to 20 deg. in some places. It was found that they could haul 20 tons more than the normal maximum load over the heaviest and longest gradient, combined with the sharpest curves, in 30 per cent. better time than that usually recorded.

The axle-loads of the "austerity" engines prevent their operating over a few of the older bridges on the system, but these are being strengthened or renewed. The two locomotives at present work over the branch line (see accompanying map) between May Pen and Frankfield, the bridges on which were designed to take much heavier loadings than at present experienced; and between May Pen and Appleton, some 40 miles across the mountains. On the latter line, the few steel bridges which were too weak have been replaced, in the manner described hereunder.

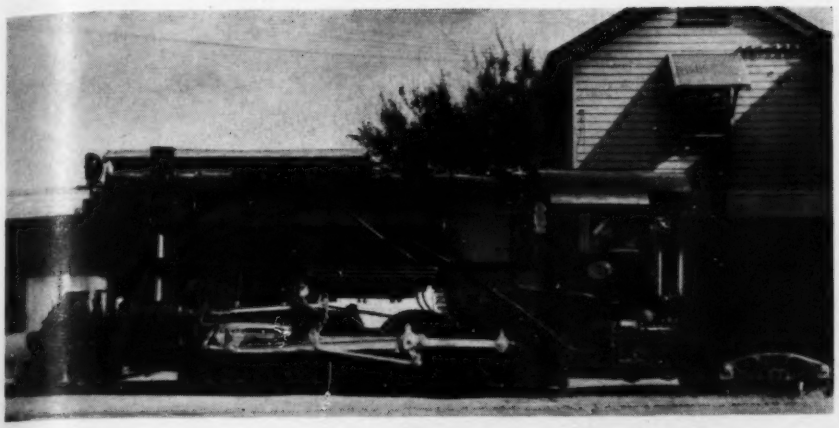
It was found that two steel bridges, supplied to the railway about 20 years ago, which had been designed to take loadings of the type given by the "austerity" locomotives, could be replaced by concrete culverts. The bridges were removed by crane, and were substituted for two weaker bridges of identical span; as the last-named is the same as that of a large number of weaker bridges on the mountain section, the two recently removed are being strengthened in the shops, as will be, gradually, all the structures which require this.

Bridges imported from the U.S.A. are replacing lighter ones between Kingston and May Pen.

A minor but unusual addition to the rolling stock of the system was made recently. This consists of a petrol-driven private railcar, for the use of the Governor of the island, and for inspection trips by the General Manager of the Government Railway, in the workshops of which it was designed and built. Due to war conditions, it was not possible to obtain a diesel engine, nor to fit the type of drive required. The latter is of the chain variety, which, in spite of causing vibration and noise at high speed, runs very smoothly at up to about 35 m.p.h.; the Hercules engine is situated in the front of the vehicle. The front bogie has spiral springs, and the wheelbase is slightly

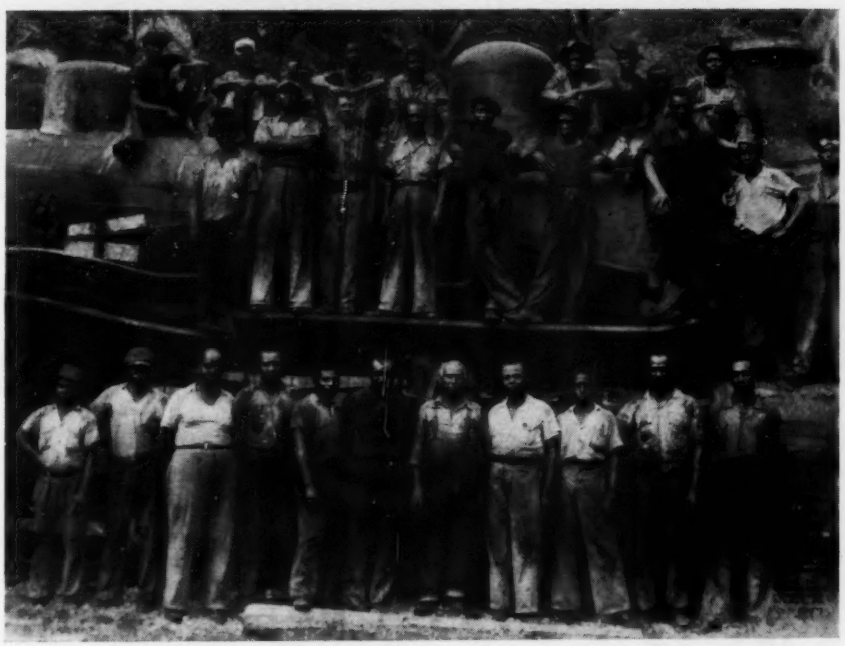


Sketch map showing the Jamaica Government Railway



One of the two 2-8-0 "austerity" locomotives built in the U.S.A. which have been acquired by the Jamaica Government Railway

longer than the gauge of the track to prevent nosing. The rear bogie has spiral, as well as ordinary elliptical, springs. The body is of all-welded construction, and the panelling is of native hardwood; and the design of the windows allows of maximum vision and ventilation. The interior equipment includes toilet and cooking arrangements, an ice-box, and other items. The General Manager states that the design and construction of the vehicle reflects great credit on the Jamaica railway staff concerned.



A group of Jamaica Government Railway workers, many of whom are excellent mechanics

Two views taken recently in the Italian Adriatic port of Bari showing one of the steam-operated light-railway trains running alongside the road. These form an important part of the transport facilities of this district

Russian Railway Frontiers

A Polish Guard beside the line on the 1939 Russo-Polish frontier with its distinctive gateway to Soviet territory. The Russian advance is rapidly bringing the Soviet Forces to this frontier

A Soviet guard formally holding up an outgoing train at a point on the 1939 Russo-Polish frontier

The Moscow—Paris express passing slowly out of Soviet Russia into Poland near Stolpce

In all these views it will be noticed that the "gateways" bear the initials of the Union of Socialist Soviet Republics, and the Russian inscription meaning "Welcome workers of the West"

RAILWAY NEWS SECTION

PERSONAL

Colonel Eric Gore-Browne, Chairman of the Southern Railway Company, has consented to be President of the Railway Benevolent Institution for 1944, in place of the late Mr. R. Holland-Martin.

The King, Sovereign Head of the Grand Priory in the British Realm of the Venerable Order of the Hospital of St. John of Jerusalem, has been pleased to sanction the admission of Mr. E. J. Missenden, General Manager, Southern Railway, as a Commander (Brother) of the Order of St. John, as from November 26, 1943.

The King on February 15, at Buckingham Palace, conferred the honour of Knighthood on the undermentioned gentlemen: Mr. Patrick Ashley Cooper; Mr. John Montague Eddy, C.B.E.; Mr. John Gibb Nicholson; Mr. Adolph Harry Railing, D.Eng., M.I.E.E.; and Mr. Thomas Somerset, M.P. His Majesty's approval of these Knighthoods was signified on January 1, 1944.

Mr. A. Murray Stephen, who is a Director of the London Midland & Scottish Railway Company, has been elected Vice-President of the Shipbuilding Conference.

Lord Kennet, who is a Director of the Southern Railway Company, has been elected to the board of the Union Discount Co. of London Ltd.

We regret to record the death in Johannesburg last November of Mr. J. A. Harris, who retired in 1935 from the position of Assistant General Manager (Commercial), South African Railways & Harbours.

RAILWAY ASSESSMENT AUTHORITY

The term of office of all members of the Railway Assessment Authority, other than the Chairman (Sir Joshua Scholefield), expired at the end of 1943, but they have been re-appointed by the Minister for a further term of five years. They are Mr. F. C. R. Douglas, M.P. (Member of the L.C.C., and recommended by that body); Sir George Etherton (Clerk of the Lancashire County Council, and recommended by the County Councils Association); Messrs. Isaac Dixon (Valuer to the West Derby Assessment Committee, and recommended by the Association of Municipal Corporations); D. L. Oliver (Member of St. Marylebone Borough Council, and recommended by the Metropolitan Boroughs Standing Joint Committee); Ernest C. King (Clerk of the U.D.C. of Coulsdon and Purley, and recommended by the Urban District Councils Association); and Neville Hobson (Clerk of the Beverley R.D.C., and recommended by the Rural District Councils Association); and the following appointed by the Minister at his discretion: Messrs. G. R. Hill (formerly Parliamentary Counsel); J. Thomas (Member and past-Chairman, Glamorgan County Council); and Samuel Lord (formerly Borough Treasurer of Acton)

Lt.-Colonel R. B. Emerson, Royal Engineers, who, as recorded in our January 14 issue, has been appointed General Manager of the Great Indian Peninsula Railway, was born in 1897 and was educated at Bradfield College, and at the Royal Military Academy, Woolwich, which he joined from the ranks of the Royal Flying Corps in 1917. He was commissioned in the Royal Engineers in 1918, and served in India, Iraq, and England until 1927. He then was transferred to civil employment with the Great Indian Peninsula Railway, and served in the Engineering, Transportation, and Stores Departments, and in the General Manager's Office. He was appointed to officiate as General Manager of that railway in 1939, but subsequently reverted to military duty, from which he is now released to take up the appointment of General Manager.

Lt.-Colonel R. B. Emerson
Appointed General Manager, Great Indian Peninsula Railway

SOUTH AFRICAN RAILWAYS & HARBOURS

Mr. J. D. P. Fourie has been appointed a Commissioner on the Railways & Harbours Board.

Lt.-Colonel W. Marshall Clark, O.B.E., Chief Works & Estates Officer, has been appointed Chief Technical Officer (Reconstruction), Headquarters.

Lt.-Colonel W. Marshall Clark, O.B.E., B.Sc.(Eng.), A.M.Inst.C.E., A.M.Inst.T., Chief Works & Estates Officer, South African Railways & Harbours, who, as recorded above has been appointed Chief Technical Officer of the newly-formed Reconstruction Department, is the son of Mr. W. H. Clark, who retired some years ago from the position of Bridge Engineer. Colonel Marshall Clark commenced his railway career in 1921 as a pupil engineer, and, after several years on construction works, was appointed District Engineer in charge of the Tuinplaats-Marble Hall construction. Later he was promoted Resident Engineer, Witwatersrand New Works. In 1940 he joined the Union Defence Forces with the rank of Major and was entrusted with the formation and equipment of Railway & Harbour Construction Companies, S.A.E.C., which later comprised the Railway & Harbour Construction Battalion, with which he served in East Africa as Second-in-Command. The battalion afterwards was reformed into a Railway Construction & Maintenance Group, S.A.E.C., which he commanded, with the rank of Lt.-Colonel. The most important of the works undertaken under his command was the construction of the Haifa-Beirut section of the Haifa-Beirut-Tripoli line. For distinguished services in the Middle East he was made O.B.E. During his absence on active service he was appointed System Engineer, Durban, and afterwards Inspecting Engineer, New Works, Johannesburg. On his return to civil duty he was made Chief Works & Estates Officer at Headquarters, and later became also Controller of Ship Repairs, which position he now relinquishes. (*See page* 231).

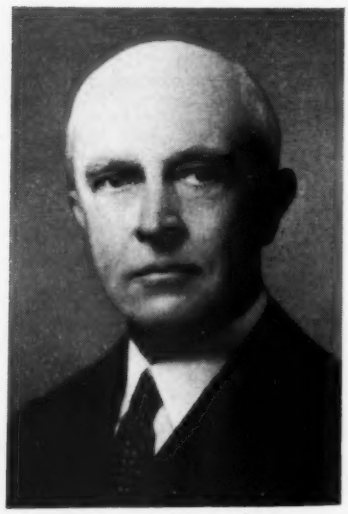
The directors of Murex Limited have appointed Mr. F. C. Mannox to be Managing Director, and Mr. H. C. Green to be General Manager, of the company.

We regret to record the death in New York on February 23, at the age of 81, of Dr. L. H. Baekeland, the well-known scientist and pioneer of plastics manufacture, who was President of the Bakelite Corporation, New York, from 1910 to 1929.

Mr. Wilfrid Hanlon, who, as recorded in our February 11 issue, has retired, on account of ill-health, from the position of Assistant Chief Commercial Manager (Goods), L.M.S.R., entered the service of the former Midland Railway in 1901 in the Goods Manager's Department at Derby, and became Chief Clerk of the Accommodation & Canvassing Office in 1919. In 1925 he was appointed Assistant to the District Goods Manager at Warrington, and in the next year assumed control of the then Chief Goods Manager's newly-enlarged Development Section at Euston. In this position Mr. Hanlon took a prominent part in the experimental work which led to the establishment of the container system on the British railways, and he was associated also with the introduction of country lorry-services on the L.M.S.R. In 1930 his responsibilities were extended to the Chief Goods Manager's Canvassing Department, and in the L.M.S.R. reorganisation of 1932 he was made Assistant (Development & Canvassing). In Octo-

Mr. Wilfrid Hanlon

Assistant Chief Commercial Manager (Goods), L.M.S.R., 1942-44



The late Mr. W. C. Lusk

Deputy-Chairman & Managing Director, Associated Electrical Industries Limited

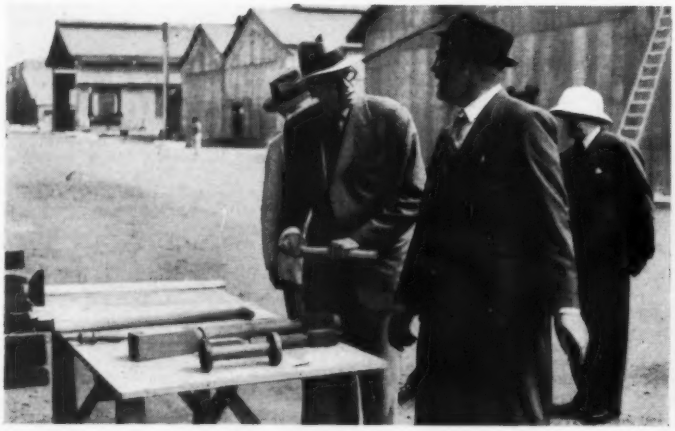
Mr. J. R. Pike

Appointed Assistant Chief Commercial Manager, (Goods), L.M.S.R.

ber, 1933, he was made Assistant (Research), in charge of the department established for undertaking commercial research. Mr. Hanlon was appointed Assistant to Chief Commercial Manager (Goods) in 1935, and to the position from which he now retires in 1942. Latterly he was associated with the Road & Rail Central Conference.

We regret to record the death on February 25, at the age of 68, of Mr. William Clardy Lusk, Deputy-Chairman & Managing Director of Associated Electrical Industries Limited, Chairman of the British Thomson-Houston Co. Ltd., and a Director of many allied and associated companies. Mr. Lusk was born in the U.S.A., and was educated at Yale University, where he took the B.Sc. degree. He received his electrical training with the General Electric Company (of New York), which selected him in 1901 to represent it in India. On the completion of that work in 1904, he returned to America before joining the London staff of his company; later he became Manager. In 1910 he was appointed Manager of the Export Department of B.T.-H. In the same year he was elected a Director, and in 1922 became Managing Director. In 1928 he took a leading part in the development of A.E.I. under its first Chairman, Mr. H. C. Levis, who was then also Chairman of B.T.-H. When Mr. Levis retired from A.E.I. in the next year, and was succeeded by Sir Felix Pole, Mr. Lusk became Deputy-Chairman of A.E.I. and Chairman of B.T.-H. He insisted on the importance of research, and during his regime the B.T.-H. research laboratory rose to its present importance. Mr. Lusk became a naturalised British subject in 1938.

Mr. J. R. Pike, Assistant to Chief Commercial Manager (Goods), L.M.S.R., who, as recorded in our February 11 issue, has been appointed Assistant Chief Commercial Manager (Goods), entered the service of the former L.N.W.R. in 1914. From 1916 to 1919 he served with the 10th Cruiser Squadron as a Sub-Lieutenant, R.N.V.R. After the war he returned to railway duties, and served at Kings Langley (Passenger) and Broad Street (Goods) Stations. Mr. Pike later was transferred to the Chief Goods Manager's Office, Euston, and, in 1923, was appointed to the then newly-formed Development Section of the Chief Goods Manager's Office. In 1931 he was appointed Personal Assistant to the Vice-President, and served successively under Mr. John Quirey, Mr. J. H. Follows, and Sir Ernest Lemon. Mr. Pike was made Assistant to District Goods & Passenger Manager, Leicester, in 1933, and a year later he was appointed Assistant (Rates Tribunal Section), Chief Commercial Manager's Department, Euston. In 1935 he became Assistant (Research) to the Chief Commercial Manager, and, in 1938, Assistant (Rates & Charges) at Watford. He became Assistant to Chief Commercial Manager (Goods) in 1942.



During his recent tour in Africa, Colonel Oliver Stanley, Secretary of State for the Colonies, inspected installations of the Kenya & Uganda Railways & Harbours

Left: Colonel Stanley with Mr. R. I. Kirkland, Assistant Chief Mechanical Engineer & Workshops Superintendent, viewing products of a carpenter's shop. Right: also with Mr. Kirkland, inspecting a workshop of the Administration

TRANSPORT SERVICES AND THE WAR—231

British Ambulance Trains

The British railways have converted 993 railway carriages into ambulance and casualty evacuation trains. It can now be revealed that, of the ambulance trains which went overseas before the collapse of France, 144 vehicles were lost.

G.W.R. Women Platelayers

There are now 350 women platelayers helping to maintain the 9,000 miles of Great Western Railway track. They are engaged on point-oiling, weeding, and lighter maintenance duties, thus releasing men for the heavier permanent-way work.

Radio on Road Vehicles

An Order-in-Council has revoked Defence Regulation 8 (3A) which provided that, apart from certain authorised exceptions, no person should use or have in his possession or under his control any radio receiving apparatus installed in a road vehicle. Such apparatus may now be carried on road vehicles without a special permit, apart from the ordinary 10s. receiving licence. An owner of a receiving set which was impounded by the Police from a road vehicle in 1940 should apply for the return of his set to the police of the District in which the set was impounded.

New Peak in Rail Transport

The Railway Executive Committee has announced that a new peak in the movement of traffic has been reached by the British railways, which are now operating 1,000,000 ton miles an hour more than they did before the war. During 1943 the record number of 45,068,000 loaded wagons were dispatched, an average weekly increase of 24,550 wagons over the previous year. In the same period the railways also forwarded 467,000 loaded containers, a figure which represents several hundreds a week more than were forwarded in 1942.

A survey taken towards the end of last year revealed that, over the busiest section of double-track line, 284 trains passed in 24 hours. These included 120 passenger trains, 12 parcels trains, and 144 freight trains composed of a total of 7,200 wagons.

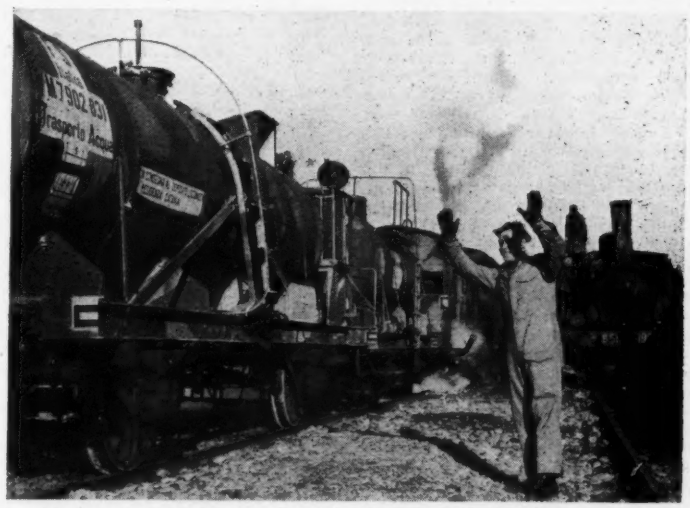
In addition to moving 900,000 loaded wagons some 77,000,000 miles every week, the British railways have now run more than 250,000 special trains for the transport of troops and military stores since the war began. Among the thousands of other special trains which run regularly every week are 7,000 for the conveyance of workers to Government factories, and 1,100 block coal trains working direct from the collieries to the consuming areas. To deal with this large increase in the movement of war traffics, British railway locomotives are spending 7,000,000 more hours per annum in traffic than they did in peacetime.

Small Consignments in Belgium

Limitations have been introduced recently in the conveyance by railway in Belgium of small consigments. A certificate showing the urgency of such consignments, to be issued by the Chambers of Commerce, must be produced in order to secure their acceptance by the railway goods offices. Various commodities are exempt from this formality, such as mineral water and alcoholic drinks, tobacco and tobacco products, medicines and pharmaceutical articles of all kinds, medical and veterinary apparatus and appliances for chemical laboratories, small livestock, seeds and bulbs, soap and cleansing materials, newspapers and magazines, fire-fighting apparatus, writing and drawing material, sacks (new and old), armaments, railway material, particularly spare parts for locomotives and materials intended for the Reichsbahn, oils, fats, leather, footwear (including wooden shoes), compressed and liquid gases, and motor fuel.

New Roumanian Railway

It was announced recently that work had begun on a new railway in the mountainous region of northern Roumania, from the present railhead of Piatra Neamt (the terminus of the 37-mile standard-gauge branch line from Bacau on the Adjud-Cernauti main line) to a place called Poiana Carmului, which is not far distant from the present Roumano-Hungarian frontier. It is stated that the cost of construction of this railway will be about RM. 30 million. This line, which will be about 38 km. (24 miles) in length, appears to be a slight enlargement of the scheme recorded in our issue of May 28, 1943 (page 541), for a 20-mile line from Piatra Neamt in a north-westerly direction to Bistricoara. It is understood that the new railway is intended to serve the manganese, copper, and bauxite deposits in the district. Such a scheme is really a revival of an old project surveyed and planned immediately after the war in 1919.



A British railwayman from the L.N.E.R., now serving with the Eighth Army in Italy, shunting Italian water tank wagons

Swiss Transport by Tractor-Hauled Sledges

A new form of transport now being introduced in Switzerland as an experiment is that provided by tractors hauling sledges. The maximum speed down-hill is 5 km. (3 miles) an hour; on level stretches 10 km. (6 miles) an hour is permitted.

C.P.R. Fire-Fighting

At its Angus Shops, Montreal, the Canadian Pacific Railway maintains one of the largest fully-equipped, privately-owned fire stations in Canada. The fire-fighting force comprising a staff of 10 permanent and 200 auxiliary firemen recruited from among thousands of shops workers. Mobile equipment includes two modern hose and ladder lorries and an ambulance. In addition, there are 40 alarm boxes, two stationary pumps, and 78 hydrants. The C.P.R. also has its own hospital at Angus, complete with medical and nursing staff. Extensive timber storage yards at Angus are protected by four fire-fighting towers 25 ft. above ground level from which can be projected hose streams of 200-ft. radius.

Augmenting normal fire precautions, Canadian Pacific personnel from Halifax and Saint John, in the east, to Victoria, in the west, have been trained in methods of combating fires which might be caused by enemy incendiary and explosive bombs. C.P.R. yard engines are equipped to fight minor fires, as an emergency hose line is attached to the injector discharge pipe of the locomotive, and a pressure stream capable of being thrown 100 ft. is immediately available.

Removing American Train Formation Limits

In the past certain American States, in particular Arizona, Nevada, Louisiana, and Oklahoma, have limited the length to which trains may be made up within their State borders. In Oklahoma, for example, the limit of length of a freight train has been 70 bogie wagons, and of a passenger train 14 vehicles. The laws were devised in the interests of safe operating, and particularly of adequate brake control on gradients, but with modern developments in motive power they have become uneconomic, and shortage of both locomotives and crews caused the railways concerned to apply in 1942 to the Interstate Commerce Commission to authorise disregard of these laws, at least during the war emergency. After enquiry, the I.C.C. issued Service Order No. 85, effective from September 15, 1942, directing the railways to operate their trains, when necessary, without regard to these limitations. In doing so, the I.C.C. declared that the Order was designed to save manpower, motive power, engine miles, and train miles; to avoid delay in train movements; to increase the efficient use of wagons, carriages, and locomotives, and to add to their availability; and to avoid terminal congestion in detaching wagons or carriages when passing over the borders of these States. Four railway operating unions—the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Enginemen and Firemen, the Order of Railway Conductors, and the Brotherhood of Railroad Trainmen, appealed against the Order, and the Attorneys-General of Arizona and Okla-

homa contested the legality of the I.C.C. action. After hearing the further evidence, however, the Commission has upheld its decision, which, it declares, is " in accord with the national transportation policy declared in the Interstate Commerce Act and fully authorised by law." It does so on the ground that the United States Congress has the power to regulate the length of trains, if it so desires, or to delegate that power to the Commission, if it elects to do so; and that the position is specifically covered by the Transportation Act of 1940. Two Commissioners gave a dissenting opinion, and one a part dissent. In giving its majority decision, however, the Interstate Commerce Commission expressly stated that the Order, " being based upon conditions of war emergency, shall not constitute a precedent for peacetime operations."

American " Blackout " Dining Cars

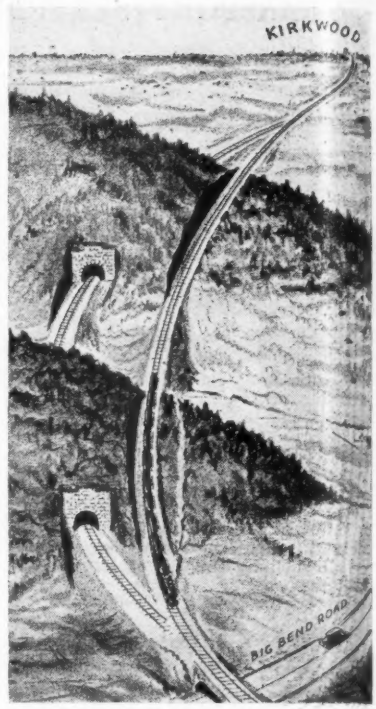
To deal with the acute dining car problem caused by the present unprecedented volume of travel, the Chesapeake & Ohio Railway has put some Spartan dining car measures into force. Four " express " cars—long bogie vans—have been converted into restaurants of the simplest type. Twelve large tables are provided, and the seats are plain slatted wooden benches, with backs but without upholstery; each car seats 48 passengers. Windows have not been cut in the sides of the dining car portion, which therefore has artificial light only, and this lack of daylight has already earned the vehicles concerned the nickname of " blackouts." At the kitchen end there are windows, however, and the kitchen equipment, including ranges, steam tables, refrigerators, ice cream wells, dish and plate racks, and storage lockers, approximates to that of a standard dining car. The staff required is a steward and a crew of nine, and meals are so systematised as to permit the service of 250 persons in 2 to 2½ hr., allowing 30 min. for breakfast and 45 min. for lunch or dinner. In every car there are 12 berths for the crew, similar in arrangement to Pullman upper berths, for overnight use. The car conversion arrangements have been effected on as simple lines as possible, to facilitate re-conversion to express cars after the war.

Improving Two American Main Routes

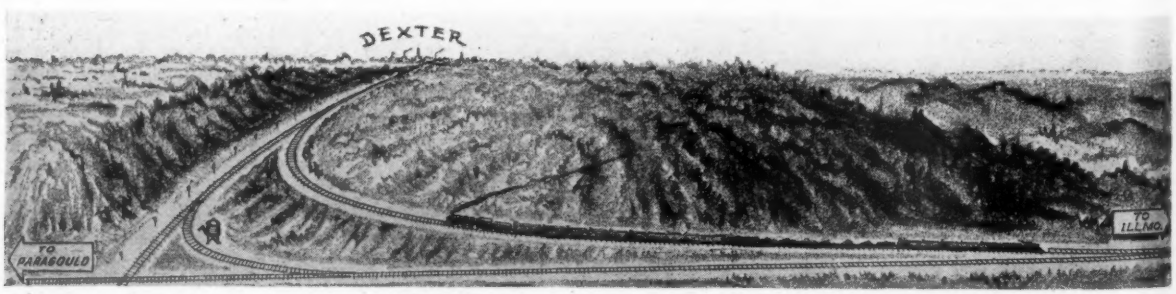
By reason of heavy war traffic, work on various American main-line railway improvements, which has been contemplated for years past but ruled out for economic reasons, is now being accelerated. One such scheme has lately been brought to completion on the Missouri Pacific Lines near Dexter Junction, and work on another is being begun immediately to the west of St. Louis. " Dexter Hill," with its 1 in 100 grade, has always been an operating problem. No. 1 freight line of the Missouri Pacific, from St. Louis to the south-west, hugs the shore of the Mississippi River on the level from Dupo to Thebes, crosses the river there, and continues by the use of running powers over the St. Louis Southwestern Railway (or " Cotton Belt," as it is generally known) to Dexter Junction. Part of the traffic continues over Cotton Belt tracks to Paragould, but the major portion turns westwards to Dexter Junction *en route* to Poplar Bluff, where it joins the Missouri Pacific main trunk line to Texas. The mile at 1 in 100 of the spur up to Dexter Junction has been made more awkward by the fact that water has been taken at the bottom of the grade, which has thus had to be tackled from a standing start, with the result that it has been necessary to divide heavy freight trains and take them up in halves. Frequently 35 min. have been spent in this way.

A new spur, 8,500 ft. long, has now been built, which hits the grade at a point higher up, and reduces the length of 1 in 100 to 3,500 ft. The junction may be taken at 30 m.p.h., and the momentum so obtained is sufficient to carry the trains comfortably up to Dexter Junction, where new watering facilities have been installed, so that water can be taken on the level. It is estimated that the alteration will permit an addition of 350 tons to southbound loads, with an annual saving of 480 locomotive days, and that eliminating the need for " doubling " the hill will save an additional 1,795 locomotive hours annually. A modified c.t.c. system has been installed up the grade, and power switches at the Cotton Belt end of the new connection are linked with the Cotton Belt c.t.c. machine at Illmo. The new watering facilities at Dexter include a 10-in. well, turbine well pump and secondhand fuel oil engine, two 100,000-gal. wooden tanks, and a 12-in. water column. Need for the alteration is expressed by the fact that, whereas in 1940 there were 198,701 bogie wagons moved up and down Dexter Hill, by 1942 the number had grown to 500,151, and in the first four months of 1943 the number exceeded by 119 per cent. that of the corresponding period of 1942. Northbound trains continue to use the old alignment.

To the west of St. Louis, on the important Eastern Division of the Missouri Pacific (the main line to Kansas City, Omaha, and Pueblo) working has long been hampered by the historic Barretts tunnels, 16 miles from the city on the Kirkwood Hill. The tunnels, one 1,100 ft. and the other 700 ft. long, were opened in the 1850s and now have insufficient clearance for modern rolling stock; in parts of the tunnels the clearance is as little as 4½ to 8¼ in., and from time to time this has ruled out the working of oversize consignments by this route. Also, as the locomotives of ascending trains are working hard, atmospheric conditions in the confined space of the tunnels are extremely bad, and, as heavy freight trains are invariably banked up the hill, engine-crews at times must wear gas masks to avoid asphyxiation. Enlargement of the tunnels under traffic, either by increasing the head clearance from 16 ft. 6 in. to 19 ft. above rail, or by lowering the track, is impossible in present traffic conditions. It has therefore been decided to construct the new route illustrated, 4,400 ft. long, and this will bypass both tunnels by keeping to the outer slopes of the two spurs through which the tunnels have been driven. Opportunity will be taken at the same time to reduce the sharpest curve on the line from 29 ch. to 65 ch. radius, which will permit the removal of a 55 m.p.h. speed limit. This is of importance, as several fast passenger trains use this route, including the Colorado Eagle and other diesel streamliners.



Intended diversion near Kirkwood, on the Missouri Pacific Lines, to avoid two low-clearance tunnels



New and improved alignment for southbound Missouri Pacific trains to Dexter to facilitate heavy war traffics. The old line remains in use for northbound (down-grade) trains

Some Problems of Reconstruction

Sir Ernest Lemon's address to the Engineering Industries Association

Sir Ernest Lemon, President of the Institution of Production Engineers and a former Vice-President of the L.M.S.R., in the course of a luncheon address to the Engineering Industries Association on February 23, dealt with some problems of post-war reconstruction, with particular reference to management, research and an industrial general staff, all of which, he said, affected the engineering industry.

Management needed to be defined. One good definition was that it was the handling of men and the handling of situations. To talk about the "science" of management was a misuse of terms; the "art" of management was more appropriate. How was this "art" to be taught? With small firms there was an obvious difficulty not met with in the larger undertakings. Moreover, the man running a small factory was often both general manager and proprietor, from causes peculiar to his particular business.

Training for management commenced naturally with the apprentices or pupils, and the problem was whether they should be trained merely as craftsmen, or their training carried to a higher level so as to provide a reservoir from which to draw potential managers. On the technical side of engineering there was ample capacity, but from a managerial point of view there was much less material to draw on.

The L.M.S.R. had found it necessary to form a staff training college with the object of selecting from the trainees there suitable men for the position of officers in the higher posts, and also as a means of collecting the best methods of practice and operation from men who had rendered expert services therein. Examination methods were not necessary; co-operation and the sharing of ideas were the basis. From all this, management and leadership would be developed, and men with such qualities would be given their chance in the higher sphere.

Although there were existing classes in administration at institutes and colleges, something more was required on the non-technical side of engineering, and it was suggested there should be a College of Commerce, to which could come for instruction in the management side of business those apprentices or pupils who had completed their technical training. The smaller firms which could not set up their own training colleges or schools could amalgamate with other firms for mutual benefit, and thus provide a pool of knowledge and resources and ideas for the common good of the particular industry.

As to the training of apprentices, some good would follow the adoption of Continental practice in this connection, where physical training also came into the curriculum. Moreover, the supervisor of apprentices should be a man of sympathy and understanding and one able to guide and observe the natural bent of the minds of the youths under his care. "Going through the mill" should have some of its unnecessary strains removed.

Research in industry would probably be given a greater stimulus in the future. With probable rising costs of production and the necessity for a high export trade to be maintained, ways and means would have to be found for keeping up the country's position in the world's markets. As an example of what might be done, reference was made to the L.M.S.R.'s action a few years ago when a scientific research committee was formed with the object of reducing the company's various problems to their elements and then suggesting methods of improving the position. The main principle adopted was to take the heavy items of expenditure, and after breaking them down to their constituent parts, explore all possible ways to provide a remedy with a reduction in cost, though not necessarily so, whilst maintaining quality of the transport factor. In other words, measure the problem, which, as Lord Kelvin said, was halfway to its solution.

Firms, even those of comparatively modest proportions, should take advantage of scientific research associations, even if only for short-term purposes. Large corporative firms had ways and means for maintaining their own research staffs for both short and long-term research.

Employees should be encouraged to ask "why" certain methods or practices were continued, and whether there were not more improved ways of operation.

Just as the Army, Navy, and Air Force had their respective planning staffs and staff college, to consider all problems that might arise due to an attack upon the country from one direction or another, so should there be an Industrial General Staff to plan in peacetime the industrial resources and how they should be utilised in time of war. This special staff could come under one of the Ministries, say the Ministry of Production, and suitable men in various industries might be earmarked for employment in particular posts in that Ministry when the contingency arose. It was worthy of earnest consideration.

At the conclusion of the address there was an animated discussion in which many speakers took part. In his reply Sir Ernest Lemon expressed his gratification at the stimulating effect of his talk, and answered many of the points which had been raised.

Canadian National Railways in 1943

In the course of a recent review of the year 1943, Mr. R. C. Vaughan, Chairman & President, Canadian National Railways, stated that, although when the final figures for the year were available, they would show both the operating net revenues and cash surplus of the company substantially to have surpassed all previous records, there was equal cause for satisfaction in the evidence of the mounting importance of the company's contribution to the war effort. Present indications were that gross revenues for 1943 would prove to be in the neighbourhood of $440,000,000, compared with $375,000,000 for the preceding year.

After payment from revenue of all operating expenses (including large amounts carried to reserves), taxes, fixed charges, interest due to the Government on loans, and other items, net operating revenue and overall surplus had been increased substantially over the 1942 figures of $86,000,000 and $25,000,000, respectively. All the resources of the company had been utilised to handle the traffic which had developed during the year, some indication of which was given by the figures below :—

Year	Freight traffic (millions of ton-miles)	Passenger traffic (millions of passenger-miles)
1943	36,233*	3,633*
1942	31,729	2,708
1939	17,084	875
1933	11,550	665
1928	23,041	1,541
1917	14,951	1,558

* Estimated

The volume of business recorded above had been handled by a staff which numbered only 7·5 per cent. more than in 1942, with a decrease of 0·2 per cent. in the number of locomotives owned, and with increases of only 2·4 per cent. and 1·6 per cent., respectively, in the numbers of freight and passenger vehicles. Although the figures did not tell the complete story because of improvements in equipment, roadbed, and so on, the traffic of 1943 had been handled with 16·6 per cent. fewer locomotives and 15·5 per cent. fewer freight, and 4·7 per cent. more passenger, vehicles than that of 1917. The ability of the property to absorb increased responsibility was dependent on its obtaining the necessary manpower, equipment and material for maintenance. Although it had been made known that problems of that nature existed and provided causes for growing anxieties, the management in many instances had endeavoured to operate with the use of substitute materials and with diminishing staffs. However, there were limits to the strain men and materials could endure.

During the year the company had received delivery of 28 locomotives, 2,757 freight vehicles and 59 passenger vehicles. In addition, 37 locomotives and 6,400 freight vehicles had been ordered during the year, but not delivered. The track and roadbed had been maintained in a safe operating condition despite serious shortages of manpower, and the system centralised traffic-control had been extended on a portion of line which carried a heavy share of war traffic. The opening in July of the Central Station and terminal in Montreal had provided that city with the largest and most modern passenger station in the Dominion, and had made possible a long-needed consolidation of most of the company's passenger services in the area.

Continuing, Mr. Vaughan said that the system had been privileged to assist the war effort by the provision of transport by land, sea and, through its associated company, Trans-Canada Air Lines, by air. The manufacture in its shops of various munitions had been continued with conspicuous success. A number of hospital vehicles in the design of which the Medical Department of the C.N.R. had assisted, already had seen useful service, and pride was felt in the splendid work accomplished by the hospital ship, *Lady Nelson*, formerly the flagship of the company's West Indies fleet. At December last, 17,035 members of the staff were on active service, many of whom already had fallen in the service of their country; Mr. Vaughan paid tribute to the officers and employees of the system, and to the co-operation of the public in its acceptance of wartime travel conditions. In conclusion, he said that, although the management held the view that no consideration must be permitted to interfere with the conduct of the system's war effort, it was not unmindful of the responsibilities it would have to assume in the post-war world as Canada's largest transport system and industry and greatest purchaser of supplies. Accordingly, considerable study had been made of those problems, and a lengthy plan had been placed before the Rehabilitation & Reconstruction Committee of the House of Commons in Ottawa.

Westinghouse Brake & Signal Co. Ltd.

Ordinary Annual Meeting

The ordinary annual general meeting of the Westinghouse Brake & Signal Co. Ltd. was held at Winchester House, London, E.C., on February 22. Captain B. H. Peter, C.B.E. (Managing Director), presided, in the absence through illness of the Chairman, Lord Herbert Scott, C.M.G., D.S.O., D.L., and read the speech prepared by the latter, in the course of which he said that Lord Southborough had retired from the chairmanship but would remain a director.

Members of the board had recently visited the company's factory. They had been well satisfied with all they had seen; the efficiency of the organisation and the splendid efforts of the members of the staff and employees of the company under the able manager—Mr. H. A. Cruse.

Captain Peter went on to add a personal tribute to Lord Southborough. Many had served the company in past years under his guidance through successful periods, and hard times—his ability, tact and great understanding were such that they who have had the pleasure of working under him would remember that period with pride and affection.

Lord Herbert was a well-tried member of the board of many years' standing; they welcomed his appointment, and he would need no assurance that behind him lay the same great loyalty that had been given to his predecessor.

Captain Peter continued: I will now say a few words on those who may be classed as management, by which I mean the board and leading officers of the company. The duties of management fall into three main classes—those to the shareholders, those to the employees of the company, and those who use the products of the company. First, our duties to the shareholders do not consist in paying the largest possible dividends, irrespective of other factors. We of the management are responsible for a great and valuable property, and would not deserve to be remembered kindly if we worked only to obtain the greatest possible dividends for shareholders now and neglected the future well-being of the company. Secondly, duties to the staff and members are many—they do not consist of merely paying fair salaries—they include every other factor which can contribute to their welfare and ability to continue to give the great service which they are giving in the service of the company, and to the building up of an efficient team working organisation. We must provide them with the possibilities of obtaining sufficient training and experience to enable them in their turn, to take more responsibilities in the days that are to come. Thirdly, our duties to those who use our products are substantial. Our major customers are the railways, responsible for millions of lives, and much depends on the quality and reliability of the apparatus we supply and our ability to develop new and improved types to meet the ever-growing needs of transport.

These three classifications of duties are not conflicting, but to hold the fair balance between them is of the greatest importance in the minds of management. We may perhaps, at times, to the shareholders, seem to be unduly cautious, but I trust that you will remember the other duties which we carry in the maintenance of the reputation of our company, and the steps that we feel are essential to continue and increase that reputation.

During the wartime period there has been great development in new methods and processes. We shall have to consider whether we must not adapt some of these to suit our particular industry, even if this involves the scrapping of present plant and expenditure of money on new machines and methods.

We have always paid a great deal of attention to research and development work. It will be necessary not merely to continue but to amplify this. It is only by such progressive action that we can retain our present position.

We can never forget the importance of what is generally classed as "Welfare Work," and in particular the growing need for the provision of ample facilities for our people to be able to continue their training and have access to facilities for doing so. In this connection I am sure you will be interested to know that we have even during the war, started libraries of books on technical and management subjects both in our head office and at our works. The immediate use which is being made of this facility, particularly at our works, is most encouraging, and provides good proof of the willingness of our people to take advantage of facilities provided for self-improvement.

We hear a great deal about the vital need of exports from this country after the war. You were told shortly before the war that in one year exports represented more than 50 per cent. of the total output of this company. During the wartime conditions that stream has died down to a mere trickle; it will not regain its volume unless we take very active steps. We shall need to send our people abroad to re-establish contacts, to learn of the changed conditions, in other countries, and again to adapt ourselves to meet their requirements.

We may expect heavy demands for the deferred repairs and maintenance on the home railways, and we may well be called on to play our part in the early stages of the rehabilitation of the European countries. We know that much work lies ahead which will require expenditure of money and much hard work.

The report and accounts were adopted. The retiring directors were re-elected; Messrs. Price Waterhouse & Company were reappointed auditors; a vote of thanks was passed to Captain Peter for presiding.

English Electric Co. Ltd.

Ordinary General Meeting

The ordinary general meeting of the English Electric Co. Ltd. was held on February 24 at Queen's House, Kingsway, London, W.C. Sir George H. Nelson, M.I.Mech.E., M.I.E.E. (Chairman & Managing Director), presided.

The Chairman said he would like to pay tribute to the memory of Mr. A. Winterbottom. He had been on the board since 1930, and his wise counsel had been greatly appreciated and will be much missed. He continued:—

Then I would like to refer to another change in the directorate, namely, the resignation of Mr. H. T. Rice, who has served the company and its predecessors for 43 years. His experience of our business, more particularly in the export field, was profound, and I am extremely pleased that he has agreed that his services shall still be available to the company in a consultative capacity.

The increase of £41,972 in the issued ordinary stock is a result of the completion of the exchange of shares with the holders of ordinary shares in D. Napier & Son Ltd., including those acquired under the Companies Act, and brings the holding in that company up to 2,184,000 5s. shares, being the total issued. This is fully reflected in the investments item on the other side of the balance sheet.

As to the activities of Napier's I cannot speak, any more than I can say of our own activities, but I can say that the great manufacturing facilities, engineering resources, and accumulated managerial experience of your company have played their part in the development, production and the successful operation of the Sabre engine which is fitted to the Typhoon aircraft. We congratulate all connected with this achievement.

This is the twenty-fifth annual general meeting of your company—in other words its jubilee. I would have wished that it were possible to have commemorated this event in some way, even if only by the publication of an illustrated brochure describing some of our achievements over these years and more particularly during the last four or five years, but circumstances today are such that this is impossible. However, I feel sure that, when we are able to give you information in this connection, you will agree that our efforts have been worthy of the great traditions of this company and the trust stockholders have in its management.

As the years pass by it becomes increasingly difficult to find fresh words which will express adequately the board's appreciation of the untiring and loyal service of the staff and workpeople. Their efforts and achievements have been truly magnificent, and I feel that the best thanks we can give to all our thousands of workpeople is the assurance that we are exerting and shall continue to exert every possible effort to secure stability of employment for the greatest number.

The main controlling factor in the achievement of these aims will be the ability of our industry and of our company by the excellence of their designs and the efficiency of their production, to meet the coming world competition. Your board has in the past and will in the future continue to provide the means by the equipment of great research laboratories and by the provision of latest and best machinery in the works; but these in themselves are inarticulate and it is only with the loyal and enthusiastic support of all our employees working in harmony that the goal will be reached.

We are proud that the relationship between employees and ourselves has been most cordial and has enabled us to achieve production records in many fields, in quantity and quality, which afford both them and us every reason for satisfaction. On your behalf, I convey our sincere thanks to all our staff and workpeople, with a special word for the members of the committees of our staff and workpeople whose help for so many years has been such an invaluable contribution to the general success of the company.

The report and accounts were adopted, the retiring director was re-elected, and the auditors reappointed

Parliamentary Notes

Tax Relief for Railway Staffs

When the Income Tax (Offices & Employments) Bill was considered in committee, as amended, in the House of Commons on February 23, Mr. Assheton (Financial Secretary to the Treasury) moved amendments to give to salaried employees of railways a similar measure of income tax relief as that given to Crown servants. Mr. Assheton said that these amendments carried out the undertaking which the Chancellor of the Exchequer had given on the committee stage during consideration of an amendment moved by Mr. T. W. Burden (Sheffield, Park—Lab.). They gave a similar measure of relief to the salaried employees of railway employers in respect of arrears of tax for 1942 to 1943, and earlier years, on what one might call their pre-railway earnings—the same relief as was given in Clause 6 by Crown employees. Since the committee stage the Board of Inland Revenue had been in consultation with the Railway Clerks' Association, and also with representatives of the railway companies, and Mr. Assheton understood that both parties were satisfied that the amendments proposed met their case.

The amendments were agreed to, the committee stage was completed, and the Bill was read a third time.

Questions in Parliament

Limitations on Rail Packages

Sir Joseph Lamb (Stone—C.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport what was the maximum limit of weight prescribed for goods consigned by service departments as priority by passenger rail service to be handled by the present temporary staff of women, youths, and old men.

Mr. Noel-Baker stated in a written answer: The weight of packages consigned by passenger service is governed by the Limitation of Packages by Passenger Train Order, 1942 (*S.R. & O.* No. 159). Under this Order, no package exceeding 1 cwt. in weight may be accepted for conveyance by passenger train, unless prior arrangements have been made with the railway company for its acceptance. The Order applies to packages consigned by the service departments.

Reserved Compartments

Captain R. H. Bernays (Bristol North—Lib. Nat.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport whether he would state the circumstances in which the railway companies, on long-distance trains for London, might be requested to label carriages "Not for Public Use," other than in the case of the Admiralty, courier, or official troop movements.

Mr. Noel-Baker: Among the other circumstances which are held to warrant labelling a compartment with the notice "Not for public use" are the conveyance of prisoners and certain other special journeys about the nature of which I would ask Captain Bernays not to press me for particulars.

Mr. E. H. Keeling (Twickenham—C.): Why could not such compartments be reserved for Overseas Airways passengers, so as to avoid running special trains for them?

Mr. Noel-Baker: That is another question which Mr. Keeling would have to put to the Secretary of State for Air.

Mr. Evelyn Walkden (Doncaster—Lab.): Would the Minister assure us that he will keep a close watch on these labels, as certain privileged persons seem, for a good-sized tip, to be able to obtain the use of the labels unlawfully?

Mr. Noel-Baker: Yes, Sir, I will watch the matter, and if Mr. Walkden will give me any evidence of abuse I will go into it.

Ilford Railway Accident Inquiry

Mr. Edgar Granville (Eye—Ind.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport if he could now make a statement on the findings of the inquiry into the causes of the railway accident at Ilford on January 16.

Mr. P. J. Noel-Baker (Parliamentary Secretary, Ministry of War Transport): No, Sir, I regret that the report on the railway accident at Ilford is still in course of preparation. It will be issued as soon as possible.

Mr. Granville: Can the Parliamentary Secretary give any indication when the report is likely to be received by his department, and when he will be able to make a statement?

Mr. Noel-Baker: I wish I could. Apart from technical difficulties, our officers often have to wait until injured passengers have recovered.

Mr. Granville: In the near future?

Mr. Noel-Baker: I hope so.

Coal Rebates

Mr. W. Thorne (Plaistow—Lab.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport if he could state the amount paid over to the Minister of Fuel & Power under the Railway Freight Rebates Act of 1943, in connection with the coal rebates and other information coming under the schedule.

Mr. Noel-Baker: The sum of £901,013 has so far been paid to the Minister of Fuel & Power under the terms of the Railway Freight Rebates Act of 1943. The Railway Rates Tribunal has made the following estimates in accordance with the schedule to the Act: For the period from the suspension of coal rebates in July, 1943, to September 30, 1943, £604,500; for the year beginning on October 1, 1943, £1,184,853.

Unnecessary Traffic

Mr. Rostron Duckworth (Manchester, Moss Side—C.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport whether he intended to intensify in the coming months his warning against unnecessary rail traffic.

Mr. Noel-Baker: The need for economy in the use of the railways is greater than at any previous period of the war, and this is being emphasised, and will continue to be emphasised, as seems desirable.

Sir Herbert Williams (South Croydon—C.): Will the Parliamentary Secretary urge on the service ministers that they might send troops about the country on unnecessary journeys to a diminishing extent?

Mr. Noel-Baker: We are in constant contact with the services and we must meet their operational requirements.

Sea and Rail Transport

Colonel T. G. Greenwell (The Hartlepools—C.) on February 16 asked the Minister of Fuel & Power if his attention had been drawn to the fact that consignments of coal from the North-East for destinations on the South Coast and in London recently had been transported by rail when sea transport was available; and if, in view of the present pressure on the railway system he would ensure that all coal possible was carried by sea.

Mr. T. Smith (Joint Parliamentary Secretary, Ministry of Fuel & Power): It is definitely the policy of my Ministry to make the fullest possible use of sea transport, but rail transport from the North-east to the destinations referred to by Colonel Greenwell cannot be entirely avoided. There are limits to the amount of shipping available for the South Coast and to the volume of traffic that can be dealt with through the London docks. There would also be handling difficulties at some of the works, which at present receive their coal by rail direct, if it were transferred to sea. I have, however, emphasised my instructions that the railborne traffic must be kept to the minimum consistent with the maintenance of essential supplies.

Transferred Workers Rail Fares

Mr. W. J. Brown (Rugby—Ind.) on February 17 asked the Minister of Labour whether, as clerical workers directed to take up employment in Government establishments away from their homes were precluded by Civil Service regulations from receiving the concession of reduced rail fares for periodical visits to their home towns and were therefore in a less favourable position than persons directed to take up manual employment in the same establishments, he would authorise for these clerical workers the reduced rail fare concession now extended to those directed into manual employment.

Mr. Ernest Bevin (Minister of Labour): Yes, sir. Persons transferred to temporary clerical employment in Government establishments, through local officers of my Ministry or the Women's Technical Services Register, are now eligible for cheap travel warrants to visit their homes on the same terms as transferred industrial workers. Permanent clerical workers in Government establishments come under Civil Service arrangements

Non-Stop Service

Mr. T. E. Naylor (Southwark South-East—Lab.) on February 22 asked the Parliamentary Secretary to the Ministry of War Transport if he would consider the advisability of instituting a general system of non-stop bus journeys from the outer London areas to the various Metropolitan termini, during the morning and evening peak hours of traffic, with a view to economising in the use of petrol and tyres and giving quicker transit to passengers unable to travel by rail.

Mr. Noel-Baker stated in a written reply: Although I recognise that Mr. Naylor's proposal would have some advantages, I am afraid that a general system of non-stop bus services would duplicate existing railway and tube services, which are much more economical of manpower and imported materials. I am informed, moreover, that buses in London cater mainly for short-distance passengers, even during the peak hours. For these reasons, and in view of our restricted resources in vehicles and personnel, I regret that I do not think it would be wise to institute the services which Mr. Naylor suggests.

Kendal-Preston Canal

Mr. Joseph Henderson (Manchester, Ardwick—Lab.) on February 23 asked the Parliamentary Secretary to the Ministry of War Transport whether, in view of present transport difficulties, he will give an assurance that he will not allow the Kendal to Preston canal to be closed.

Mr. Noel-Baker: The Minister of War Transport does not propose to close this canal during the present emergency.

Notes and News

Swiss Federal Railways.—Working receipts of the Swiss Federal Railways for 1943 amounted to fr. 477,430,000, an increase of fr. 9,103,000 over 1942, and working expenditure rose by fr. 25,696,000 to fr. 304,156,000.

Metropolitan Graduate & Student Society Meetings.—The paper by Mr. C. W. Herbert on "Lighting in Relation to Railways," which was to have been read before the Metropolitan Graduate & Student Society, Institute of Transport, on February 19, but was postponed, will be read on March 18. Mr. A. G. Course's paper on "World Communications," announced for the latter date, will be given at an extra meeting on April 15.

C.N.R. Rolling Stock.—It is reported that construction is to be commenced, in the Transcona Shops of the Canadian National Railways, of 200 refrigerator vans, which will make use of the latest type of overhead icing system to be developed by the company. Details are given under Contracts and Tenders on page 231 of extensive orders recently placed by the C.N.R. with Canadian firms for locomotives and wagons.

L.M.S.R. Paper Salvage.—Despite the reduced scope for salvaging paper due to the restricted use of newspapers, coverings for goods and so on, nearly 3,300 tons was collected by L.M.S.R. staff in the last twelve months—the second highest total on record. This brings the total amount of waste paper recovered on L.M.S.R. property in four years to over 13,000 tons—enough to produce nearly one-and-a half million 4·5 in. A.A. shell containers.

French National Railways Traffic.—Reuters reports that, according to a report issued by the French National Railways, quoted by the official German news agency from Paris, although during the period 1938-42 70 per cent. of all passenger-traffic vehicles discontinued service, 580 million passengers travelled in 1942, compared with 540 million in 1938. By the economic use of space in wagons, 102 million tons of goods was transported in 1942, which was less than the figure for 1938 by only 13 million tons.

Spanish Goods Traffic Increase.—According to statistics published recently by the Spanish State Council for the Co-ordination of Transport, the weekly average number of goods wagons loaded during the period from July, 1942, to June, 1943, was 59,200, as compared with 56,600 for the period from July, 1941, to June, 1942. The monthly goods-train mileage has increased from approximately 1,860,000 miles in 1935 to the present average of 2,170,000 miles. During the 1942-43 period the railways carried 482,300 wagon-loads of coal and 11,000 wagon-loads of cement.

Jonas Woodhead & Sons Ltd.—Speaking at the 24th ordinary general meeting, Captain Allan G. Kyle, the Chairman, said that once again the period under review had provided an output far ahead of anything achieved in the company's long history. This result was the more remarkable when it was remembered that not only had the plant and equipment been wearied by intensive and continuous production, but the human element had been subjected to a strain of corresponding severity. The increased production had resulted in an increase in trading profit, but these figures were completely overshadowed by the incidence of taxation. Heavy provisions for reserves had reduced the balance available for dividends, but it was sufficient to maintain a dividend of 10 per cent. on the ordinary shares and to carry forward a slightly higher figure. The directors had been working in the closest collaboration with industrial federations and associations who had the matter of post-war planning under continuous study.

Cost-of-Living Index.—The official cost-of-living index figure at February 1 was 100 points above the level of July, 1914, compared with 99 points at January 1. In February, 1938, it was 57 points, and in February, 1939, 55 points, above the level of July, 1914.

Canadian Locomotive Company Orders.—It is stated that, by the end of last year, 25 of the 75 locomotives ordered by the Indian State Railways from the Canadian Locomotive Company had been shipped. On the completion of this order, which is expected to be about next May, the company will commence the production of 45 large locomotives for the Canadian Pacific Railway.

Santa Fé Railways' Purchase.—It is announced that the Province of Santa Fé Railways Company has been authorised by the Ministry of Public Works to purchase and incorporate in its system a branch line from Coronel de Graty to Santa Sylvina, in the Chaco territory' at present operated as an industrial branch line by the Sociedad Anonima de Explotaciones Forestales "Tres Monjes." The price has been fixed at 378,545 pesos, to include land rights, and station buildings, permanent way and other items.

Russian Turbo-Electric Locomotive.—Test runs totalling 31,000 miles have just been completed in Russia by a turbo-electric locomotive built to the design of the Russian Engineer, L. M. Meysel; these tests are stated to have been entirely successful. Coal consumption was found to be only half of that of a normal locomotive for the same class of work; runs of up to nearly 250 miles can be accomplished without the need for taking water. After some minor improvements have been carried out the locomotive will be put into regular service.

Dublin United Transport Co. Ltd.—At the extraordinary general meeting of the Dublin United Transport Co. Ltd., held on February 11, it was announced that the shareholders had, by 21,972 votes to 3,691, agreed to the Eire Government's terms for the compulsory acquisition of the undertaking of the company. As already announced, stockholders will receive for every £10 (nominal) stock, either preference or ordinary, £14 10s. 0d. (nominal) 3 per cent. debenture stock, guaranteed by the Government as to interest and capital, in the proposed new statutory transport company.

Presentation to Mr. W. M. Perts.—On February 22 Mr. W. M. Perts, who retired at the end of last year from the position of Commercial Superintendent, Southern Railway, was the recipient of a presentation from a large number of railway officers who were members of the Accountants', Goods Managers', Mineral Managers' and Superintendents' (Coaching & Operating) Conferences, Railway Clearing House. Mr. G. Marshall (Chairman of the Goods Managers' Conference) presided, supported by Mr. F. A. Pope (Chairman of the Superintendents' Conference) and Mr. C. N. Mansfield (Chairman of the Mineral Managers' Conference). Mr. Marshall said that Mr. Perts had been a valuable member of the conferences on which he served. The fact that so many railway officers had subscribed towards the presentation was an indication of the many friendships he had made during his long career. A number of others (including Mr. T. E. Argile, late Chief Commercial Manager, L.M.S.R., and Mr. A. Maynard, late Chief Goods Manager, G.W.R.) also expressed their personal respect for Mr. Perts and best wishes for his future happiness. Mr. Perts, accepting the gift, paid tribute to the kindness he had received from his old colleagues and

British and Irish Railway Stocks and Shares

Stocks	Highest 1943	Lowest 1943	Prices Feb. 29, 1944	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	65½	57¼	58¼	– ¼
5% Con. Pref. ...	120½	108	118½	–
5% Red. Pref. (1950)	110½	106	108	–
5% Rt. Charge ...	137½	123½	131½	–
5% Cons. Guar. ...	135½	121⅞	128½	–
4% Deb.	118	107½	114½	–
4½% Deb.	119	109⅞	115¾	–
4½% Deb.	124½	116	122½	–
5% Deb.	138	127	131½	–
2½% Deb.	77	72½	74½	–
L.M.S.R.				
Ord.	34⅛	28	30	– ¼
4% Pref. (1923) ...	66½	58	61	–
4% Pref.	80½	73	78	–
5% Red. Pref. (1955)	105⅜	102	103½	–
4% Guar.	107	98½	103½	–
4% Deb.	109⅜	103½	107½	–
5% Red. Deb. (1952)	111½	108	109½	–
L.N.E.R.				
5% Pref. Ord. ...	12⅞	7⅜	9½	–
Def. Ord.	5⅜	3⅜	4⅜	– ¼
4% First Pref. ...	66½	57½	60	–
4% Second Pref. ...	36½	30¾	32½	– ¼
5% Red. Pref. (1955)	99⅜	93	97½	+ ⅛
4% First Guar. ...	102¾	94	100	–
4% Second Guar. ...	93½	85⅜	93	–
3% Deb.	86⅜	78⅜	81½	–
4% Deb.	109⅞	101⅜	107	–
5% Red. Deb. (1947)	106½	102	104	–
4½% Sinking Fund Red. Deb. ...	108	103½	104½	–
SOUTHERN				
Pref. Ord.	80	72½	76½	– ⅛
Def. Ord.	26⅜	20⅜	23½	–
5% Pref.	119½	106⅝	117½	– ¼
5% Red. Pref. (1964)	114	108½	113½	–
5% Guar. Pref. ...	136	122	128½	–
5% Red. Guar. Pref. (1957)	117	109⅜	113½	–
4% Deb.	117½	106	114½	–
5% Deb.	137	126	130½	–
4% Red. Deb. (1962-67)	112	106½	109½	–
4% Red. Deb. (1970-80)	112	107	109½	–
FORTH BRIDGE				
4% Deb.	109	104⅜	105	–
4% Guar.	105	102½	103½	–
L.P.T.B.				
4½% "A"	125⅛	114	123½	–
5% "A"	133⅞	123	130½	–
3% Guar. (1967-72)	100½	97	99	–
5% "B"	124	114	121½	–
"C"	72	53	66	–
MERSEY				
Ord.	34½	27	33½§	– ⅛
3% Perp. Pref. ...	68	59½	66§	–
4% Perp. Deb. ...	104	102½	103	–
3% Perp. Deb. ...	83	78½	79	–
IRELAND				
BELFAST & C.D.				
Ord.	9	6	6	– ⅛
G. NORTHERN				
Ord.	24½	16	21⅜	– ⅜
Pref.	—	—	40½	+ ⅛
Guar.	—	—	60½	– ⅛
Deb.	—	—	84	+ ⅛
G. SOUTHERN				
Ord.	30	9½	57	+ ⅛
Pref.	30	11	57	–
Guar.	64	26½	68½	–
Deb.	88⅛	51⅛	89⅛	+

§ ex-dividend

the willing and loyal help given by the members of the junior conferences, at which much of the spade work was done and useful experience gained.

San Paulo and Air Traffic.—San Paulo, the second largest city in Brazil, has now been made a regular stop on the daily coastal air service of Pan-American Airways Inc. between Rio de Janeiro and Buenos Ayres.

Agreed Charges.—Applications have been made to the Railway Rates Tribunal for the approval of 50 further agreed charges under the provisions of Section 37 of the Road & Rail Traffic Act, 1933. Notices of objection must be filed on or before March 14.

Chilean Locomotive Manufacture.—The Chilean State Railways have arranged for the construction in their San Bernardo shops of six locomotives of the 2-8-2 type for use on the cut-off between Longotoma and Los Vilos. It would appear that this will amount to locomotive assembly rather than to complete construction, as many important parts, such as boilers, wheels, and trucks, which cannot be made locally have been ordered from abroad.

Aveling-Barford Limited Patent.—Aveling-Barford Limited has made application for the restoration of the patent granted to it for an invention entitled "Tipping vehicles" numbered 496714 and bearing date May 29, 1937, which ceased on May 29, 1941, because of non-payment of the prescribed renewal fee. Any person may give notice of opposition to the restoration by lodging Patents Form No. 17 at the Patent Office, 25, Southampton Buildings, W.C.2, on or before April 3.

B.E.T. Group National Savings.—The total savings for the three months to December 31, 1943, of the British Electric Traction Group was £45,583. The "average savings per contributor" figures of the first six companies in the group are as follow :—

Sheffield United Tours	8s. 10d.
East Midland	8s. 4d.
North Western	8s. 1d.
Ribble	8s. 0d.
Aldershot	7s. 10d.
County Motors	5s. 9d.

The number of persons contributing was 15,518. The aggregate savings to date are £414,281.

Institute of Welding.—At a meeting of the Institute held at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, on March 1, at 6 p.m., Mr. W. K. B. Marshall, B.Eng., read a paper on "Recent Developments in the Welding of Light Metals." Further meetings will be held on : (1) April 12, at 6 p.m. (not, as had been previously arranged, on May 17), when Dr. L. Reeve will read a paper on "Factors Controlling the Weldability of Steel"; and (2) May 17, at 6 p.m., when Dr. J. H. Paterson will read a paper on "The Welding of Plastics," after which a demonstration will be given.

General Montgomery Meets Railway Staffs.—On February 22 General Sir Bernard Montgomery in London met a gathering of men and women representing every grade of railway staff from all over the country. Representatives of the railway trade unions and the Railway Shopmen's National Council were present. At the end of General Montgomery's address, expressions of their appreciation of his most interesting and helpful talk were made by Sir Alan Anderson, Chairman of the Railway Executive Committee; Sir James Milne, Chairman of the General Managers' Conference; Mr. J. Benstead, General Secretary, National Union of Railwaymen; Mr. W. P. Allen, General Secretary, Associated Society of Locomotive Engineers & Firemen; Mr. C. N. Gallie, General Secretary, Railway Clerks' Association; and Mr. R. Openshaw, Chairman of the Employees' Side of the Railway Shopmen's National Council.

Welsh Highland Light Railway.—An Order for the winding-up of the Welsh Highland Railway (Light Railway) Company, was made on February 7 by the Chancery Division (Companies Court) on the petition of the Carnarvonshire County Council (creditor of the company).

Aire & Calder Navigation Order.—Under the Special Enactments (Extension of Time) Act, 1940, the Minister of War Transport has made an Order (S.R. & O. 1944, No. 116) modifying certain provisions as to time laid down in the Aire & Calder Navigation's private Acts of 1884, 1899, and 1908.

Mersey Railway Company.—At a meeting of the Board held on February 22, 1944, it was resolved :—(1) To pay the full dividend of 3 per cent. on the perpetual preference stock, less income tax at 10s. in the £ for the year ended December 31, 1943; (2) to recommend payment of a dividend on the consolidated ordinary stock of 2⅜ per cent., less income tax at 10s. in £ for year ended December 31, 1943. The dividend on the ordinary stock for 1942 was 2⅜ per cent.

Scinde, Punjaub & Delhi Railway Annuities.—The 786 miles of the Scinde, Punjaub & Delhi Railway Company were purchased by the Government of India under the powers of an Act of 1886, which provided for the purchase by means of annuities, namely, Class "A" representing capital and interest, and Class "B." It is now notified that on December 31, 1943, a total sum of £3,817,543 was invested for the purpose of providing a sinking fund in respect of the Annuities Class "B."

Argentine Irrigation Scheme.—The Argentine Government has issued a Decree approving plans prepared by the Government of the Province of Salta for an important irrigation scheme, for which the sum of 2,215,265 pesos has been allocated. The main feature of the scheme will be the construction of a dam, some 2,600 yd. long, on the Rio Blanco, to irrigate an extensive tract of arid country. It is proposed also to extend the irrigation works on the same river near Rosario de Lerma, at a cost of 307,354 pesos.

Arica-La Paz Railway Service Suspended.—Reuters reports that, due to heavy rain in northern Chile, the railway service between Arica and La Paz has been interrupted, and that repair work will take more than three months. It is understood that the Bolivian Government will ship the 4,000 tons of minerals, rubber and special bark which is sent monthly for England from the ports of Mollendo and Antofagasta. Merchandise for Bolivia is held up at Arica, as there is no alternative railway route to La Paz.

R. A. Lister & Co. Ltd.—The report for the year ended September 30, 1943, states that the gross profit amounted to £399,383 (£404,076). After deducting directors' fees, pensions, etc., and providing £212,036 (£237,248) for taxation, and £43,503 (£38,712) for depreciation, there is a profit of £136,839 (£121,007). Adding £71,475 brought forward makes £208,314. The interim ordinary dividend was 5 per cent. (same); the final dividend is again 5 per cent., and the bonus of 6 per cent. is repeated. Transfers are made of £35,790 to contingencies reserve and of £35,000 to general reserve, leaving £72,524 to be carried forward. The factories have been fully utilised in assisting the war effort during the current year.

Chilean Railway Sale.—The proceeds of the sale of the Caleta Buena-Negreiros Railway in Chile, estimated at about 5,000,000 pesos, are to be invested in public works in the Province of Tarapaca. The equipment of the railway was turned over to the Iquique-Pintados Railway.

Proposed Santiago Underground Railway.—Transport difficulties in Santiago, Chile, are resulting in renewed interest being taken in the proposals for the construction of an underground railway system, for which preliminary studies have already been made by the Railway Department of the Chilean Ministry of Transport & Public Works. The cost of construction and equipment is estimated at 240,000,000 pesos. The lines would be from 20 to 36 ft. below the surface.

Opposition to Indian Passenger-Fare Increase.—It is reported that considerable opposition is being expressed to the proposal, announced by Sir Edward Benthall in his recent railway budget speech, for an increase of 25 per cent. in passenger fares in India (see our last week's issue, page 178). The Central Assembly on February 24 passed a motion of censure on the Government of India in this connection, and, in the course of a three-day debate on the railway budget, the Government was defeated three times and was twice saved only by the casting votes of the President.

South African Post-War Railway Schemes.—Mr. F. C. Sturrock, Minister of Transport, Union of South Africa, introduced the railway budget on February 28. He announced a surplus on the year's working of £500,000, and a £30,000,000 programme of railway extensions and improvements to be carried out after the war. Provision is being made in next year's estimates for the running of a fleet of nine ships, consisting of those which belong to the Railway Administration and those chartered from the Government. The Minister added that, in spite of the smaller number of ships calling at South African ports, the volume of ship-repair work had remained high. The appointment of Lt.-Colonel W. Marshall Clark as Chief Technical Officer of the Reconstruction Department, which has been newly formed to deal with post-war development, is recorded on page 223; a biography of Colonel Marshall Clark also is given.

Contracts and Tenders

Below is given a list of orders placed recently by the Egyptian State Railways :—

Post Office Stores Department : Condensers.
General Electric Co. Ltd. : Switchboxes.
Siemens Bros. & Co. Ltd. : Dry cells.
Federal Telephone & Radio Corporation : Single-contact single-line brushes.

The following orders have been placed by the Canadian National Railways :—

Montreal Locomotive Works Limited : 20 4-8-2-type locomotives.
Canadian Car & Foundry Co. Ltd. : 2,300 box wagons and 200 flat wagons.
National Steel Car Corporation Limited : 2,050 box wagons.
Eastern Steel Car Co. Ltd. : 700 box wagons and 600 70-ton hopper wagons.

Railway Stock Market

Although there was no improvement of business in Stock Exchange markets, the general tendency of security values was firmer than at the end of last week when there was a disposition for prices to be marked down because of the small demand in evidence. Confidence in the outlook was shown by the absence of any selling pressure, and in some directions the lower prices have been inclined to attract buyers. British Funds were only fractionally lower on balance. Home railway prior charges have well maintained recent gains, aided by the general steadiness in leading investment securities. On the other hand, junior stocks have been reactionary due to the uncertain tendency which developed in many securities of the ordinary or equity class. Earlier in the week sentiment as to junior stocks of the main-line railways was also governed by the tendency to await the annual meetings, which as pointed out in these notes, have been awaited with even more than usual interest on this occasion. The recent renewal of air-raids by the enemy, it is hoped, will come as a reminder of the circumstances in which the existing railway rental agreement was negotiated, and the factors which then had to be borne in mind, particularly the possibility of heavy air-raid damage. As events have worked out, the agreement has proved of greater financial benefit to the Government than to the railway stockholders; but it should not be overlooked that even if the railways had suffered very heavy air-raid damage, stockholders could still have received dividends at around current rates. It is true, of course, that it is disappointing the wartime rental was not on a standard revenue basis, and that as events have worked out the Government appears to have driven a hard bargain with the railways; but it should not be overlooked that the agreement was made when there was a threat of invasion of this country. The fact remains, however, that the railways clearly have demonstrated their ability to deal efficiently with a much greater volume of traffic than is likely to be experienced in peacetime.

Consequently, bearing this in mind, and that in practice the wartime financial agreement has involved sacrifices on the part of stockholders, there is every reason to expect the railways and their stockholders to be treated fairly in postwar transport developments. As mentioned in these notes on previous occasions, the large yields on home railway junior stocks are not due to the very moderate dividends permitted by the wartime rental agreement and the very limited scope for better dividends while the latter is in force, but to uncertainty as to the post-war prospects of the railways in relation to transport organisations and control.

Nevertheless, the yields of around 8 per cent. now appear so attractive, that it seems probable that, when markets improve, home railway junior stocks cannot fail to attract buyers and show general improvement in prices. Great Western ordinary has declined further from 59 to 58¼. On the other hand, the 5 per cent. preference stock was maintained at 118½, as was the guaranteed stock at 129, and the 4 per cent. debentures were 114¼. L.M.S.R. ordinary was 30⅛, compared with 30½ a week ago, and the 1923 preference eased further from 61¼ to 60¾, and the senior preference from 78 to 77¾. L.M.S.R. guaranteed was maintained at 103½. In accordance with the general tendency in junior stocks, L.N.E.R. second preference eased further from 32½ to 32¼, and the first preference from 60½ to 59¾ (a point lower than L.M.S.R. 1923 preference) but the guaranteed stocks maintained a steady tendency, and the 3 per cent. and 4 per cent. debentures were 81½ and 107 respectively. Among Southern stocks, the deferred was 23¼, compared with 23¾ a week ago, and the preferred 76¾ compared with 77; but the guaranteed stock remained at 129 and the 5 per cent. preference was 117½. London Transport "A" and "B" stocks attracted investment buying. Moreover, the "C" showed further improvement from 66½ to 67.

The unsettled political situation in the Argentine resulted in a general decline in Argentine railway stocks, although little selling was reported. B.A. Gt. Southern ordinary was 12, as against 12¾ a week ago, the 5 per cent. preference 24, compared with 25½, and the 4 per cent. debentures 59, compared with 60½. In other directions, United of Havana debentures reacted from 29 to 26½, and Leopoldina debentures were 52½. San Paulo ordinary rallied from 48½ to 50. French railway sterling bonds were marked lower. Canadian Pacifics have been below the level of a week ago.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1941/2	No. of Weeks	Aggregate traffics to date: Totals 1942/3	Aggregate traffics to date: Totals 1941/2	Aggregate traffics to date: Increase or decrease	Shares or stock	Prices: Highest 1943	Prices: Lowest 1943	Prices: Feb. 29, 1944	Prices: Yield % (Class)
				£	£		£	£	£					
South & Central America	Antofagasta (Chile) & Bolivia	834	20.2.44	30,330	+ 2,690	8	240,830	216,150	+ 24,680	Ord. Stk.	15¾	10	12	Nil
	Argentine North Eastern	753	19.2.44	14,364	+ 4,332	34	483,922	421,200	+ 62,622	,,	7⅞	5	6	Nil
	Bolivar	174	Jan., 1944	4,689	— 603	5	4,689	5,292	— 603	6 p.c. Deb.	22½	18	18½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	23½	19	17½	Nil
	Buenos Ayres & Pacific	2,807	19.2.44	122,760	+ 7,560	34	3,391,380	3,234,240	+ 157,140	Ord. Stk.	8½	5¼	6½	Nil
	Buenos Ayres Great Southern	5,080	19.2.44	245,640	+ 38,340	34	5,878,800	5,314,740	+ 564,060	Ord. Stk.	17½	9½	12	Nil
	Buenos Ayres Western	1,930	19.2.44	77,220	+ 21,540	34	1,837,980	1,802,340	+ 35,640	,,	16	9⅞	11½	Nil
	Central Argentine	3,700	19.2.44	167,628	+ 19,236	34	4,931,286	4,456,569	+ 474,717	,,	10⅜	6½	8½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4⅜	3	4	Nil
	Cent. Uruguay of M. Video	972	12.2.44	34,660	— 5,350	33	1,089,144	834,821	+ 254,323	Ord. Stk.	7⅜	4¼	4¾	Nil
	Costa Rica	262	Jan. 1944	22,665	+ 6,018	29	152,859	96,556	+ 56,303	Stk.	16	12½	15	Nil
	Dorada	70	Jan., 1944	26,020	+ 5,430	5	26,020	20,590	+ 5,430	1 Mt. Db.	96	92	93½	6⅜
	Entre Rios	808	19.2.44	18,900	+ 3,234	34	668,418	611,568	+ 56,850	Ord. Stk.	9	5¼	5½	Nil
	Great Western of Brazil	1,030	19.2.44	23,900	+ 7,100	8	169,500	128,700	+ 40,800	Ord. Sh.	59/9	24/+½	25/-	Nil
	International of. Cl. Amer.	794	Dec., 1943	$696,368	+ $50,157	52	$7,285,649	$6,200,530	+ $1,085,119	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	2¾	1⅛	1½	Nil
	La Guaira & Caracas	22¾	Jan., 1944	6,640	— 2,795	5	6,640	9,435	— 2,795	5 p.c. Deb.	90	80	88½	Nil
	Leopoldina	1,918	19.2.44	44,834	+ 14,949	8	312,809	219,297	+ 93,512	Ord. Stk.	7⅛	4	5	Nil
	Mexican	483	14.2.44	ps. 381,300	+ ps. 29,700	7	ps.2,361,800	ps. 1,921,200	+ ps. 440,600	Ord. Stk.	1⅞	⅜	½	Nil
	Midland Uruguay	319	Nov., 1943	17,647	+ 2,530	22	8,514	65,903	+ 17,611	—	—	—	—	—
	Nitrate	382	15.2.44	15,298	+ 9,108	7	27,130	18,341	+ 8,789	Ord. Sh.	83/9	71/3	68/9	Nil
	Paraguay Central	274	18.2.44	$36,338	— $2,322	34	$1,726,665	$1,301,210	+ $425,455	Pr. Li. Stk.	75	51½	69	8⅝
	Peruvian Corporation	1,059	Jan., 1944	111,444	+ 25,677	31	7,816,434	583,434	+ 165,197	Pref.	17⅜	10¼	10	Nil
	Salvador	100	Dec., 1943	c 174,000	+ c 62,000	25	c 603,000	c 432,000	+ c 171,000	—	—	—	—	—
	San Paulo	153¼	—	—	—	—	—	—	—	Ord. Stk.	71	5	50	4
	Taltal	160	Jan., 1944	5,485	+ 2,155	31	40,710	34,416	+ 6,249	Ord. Sh.	3"/6	20/-	20/-	Nil
	United of Havana	1,301	19.2.44	72,376	+ 14,434	34	1,664,499	1,565,651	+ 98,848	Ord. Stk.,	8⅝	3¼	3	Nil
	Uruguay Northern	73	Nov., 1943	1,568	+ 101	21	7,125	6,224	+ 901	—	—	—	—	—
Canada	Canadian Pacific	17,034	21.2.44	1,090,600	+ 165,800	8	8,041,000	6,597,400	+ 1,443,600	Ord. Stk.	18	13⅞	15½	Nil
India†	Barsi Light	202	Jan., 1944	20,625	— 4,170	43	212,025	175,313	+ 36,712	—	—	—	—	—
	Bengal-Nagpur	3,267	Dec., 1943	939,400	— 85,625	39	9,161,775	8,0 1,550	+ 1,080,225	Ord. Stk.	104½	101¼	103½	3⅞
	Madras & Southern Mahratta	2,939	10.1.44	282,900	+ 34,826	33	7,801,260	6,679,643	+ 1,130,617	,,	110	106	108½	6½
	South Indian	2,349	20.12.43	197,410	+ 24,449	37	5,321,558	4,562,445	+ 750,113	,,	105½	101¼	108½	4
Various	Egyptian Delta	—	10.1.44	20,452	+ 5,363	42	459,709	358,834	+ 100,875	Prf. Sh.	6⅛	2⅞	6	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	45	32	40	8§
	Midland of W. Australia	277	Dec., 1943	30,839	+ 423	25	196,644	190,328	+ 6,317	Inc. Deb.	101	93	100	6
	Nigerian	1,900	30.12.43	68,456	+ 7,866	26	1,933,466	1,833,420	+ 160,046	—	—	—	—	—
	South Africa	13,291	9.1.44	855,671	+ 40,041	42	33,930,523	31,610,827	+ 2,329,596	—	—	—	—	—
	Victoria	4,774	Oct., 1943	1,289,829	— 155,702	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛ Argentine traffics are given in sterling calculated @ 16⅛ pesos to the £
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend